NAVAL ARMAMENT

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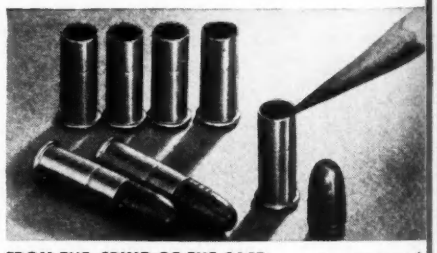
BRUCE M. BURCHARD
RT. # 1, BOX 269
WALNUT CREEK, CALIF.

If you bought Peters 22's by the bushel . . .

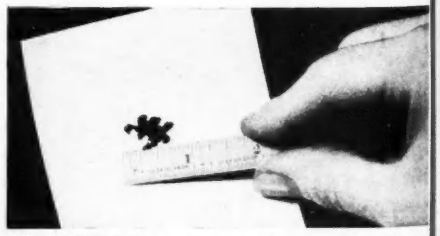
. . . instead of the box, you'd still have far to go before you found one cartridge that differed from another. This is one of the many reasons for the amazing *accuracy* of Peters match ammunition . . . *perfect uniformity* from cartridge to cartridge, box to box, case to case.

Every day, skilled technicians check Peters match ammunition as it goes through the production line . . . to make sure of this *sameness* that counts. Each element in every cartridge . . . bullets, cases, powder, and priming . . . must conform to *micro-close tolerances* before it passes inspection. And, finally, before shipment, samples are test-fired on Peters ballistics ranges as a further measure of perfection.

As a result, when you shoot Peters in a tournament, you get support for possible after possible. Why not get a supply of Peters "Dewar Match" or Peters "Police Match" for your next tournament? All in all, there is no more accurate rim fire ammunition in the world. And remember Peters "Target" 22's for practice.



FROM THE CRIMP OF THE CASE . . . to sameness in bullet, primer and powder, testing for perfect uniformity is the theme in the production of Peters match ammunition.

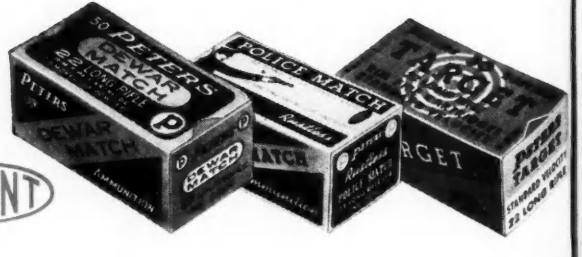


TIGHT GROUPS! Control samples from every lot of Peters match cartridges you shoot have been test-fired from guns in machine-rest on Peters ballistics ranges. Many a group shot on these ranges is the size of a 25¢ piece.

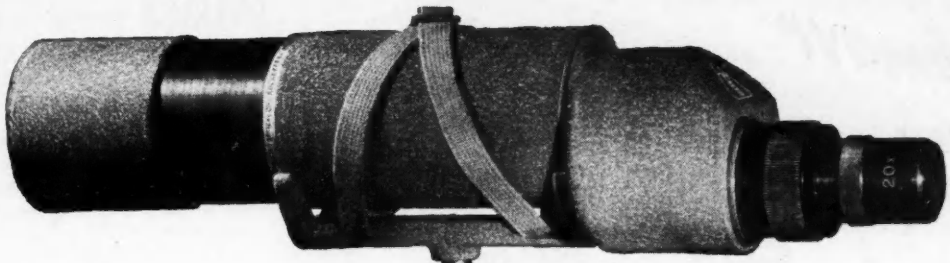
PETERS

PACKS THE POSSIBLES

PETERS CARTRIDGE DIVISION — *Remington Arms Company, Inc., Bridgeport 2, Conn.—"Dewar Match" and "Target" are Reg. U.S. Pat. Off.—"Police Match" is a trademark of Peters Cartridge Division.*



DU PONT



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WITH 20X EYEPIECE, $95.00

Since Bausch & Lomb first introduced its line of Spotting Scopes—the first instruments ever made to fulfill exactly the special requirements of shooters—Bausch & Lomb Scopes have been the overwhelming favorite among champions and high-ranking shooters. For performance that will bring the most out of your ability, investigate the Bausch & Lomb 60mm Scope—the new compact instrument with the extra-long eye distance, the "one click to mirage" feature, the non-jamming eyeshade, the durable shock-proof construction. Write for descriptive folder and specifications. Bausch & Lomb Optical Co., 276-G Lomb Park, Rochester 2, New York.

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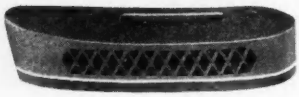
FOR SHOTGUN OR RIFLE

Pachmayr RECOIL PADS



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Best by scientific and field test . . . Unconditionally Guaranteed. Rifle Butt Pads . . . $2.00

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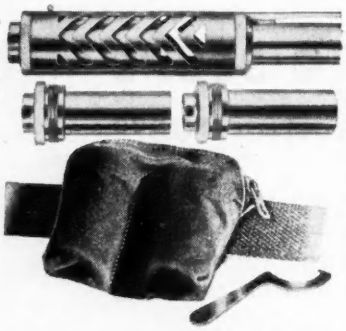
Holds four hand-guns plus scope and accessories. Beautifully made, flock lined for full protection to guns. Compact and lightweight. $19.75



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The new POWer-PAC shot control variable choke attachment for single barrel shotguns gives truly amazing performance . . . perfect patterns at all ranges . . . packed with greater killing power . . . greater recoil reduction and elimination of annoying muzzle blast that hurts your ears. $18.50

Complete with 3 tubes belt carrying case and wrench. Factory Installation: $3.50

CLEAR SIGHT SCOPE CAPS

Neoprene caps with optically flat clear glass, stays on scope ready for use yet gives full protection. Guaranteed not to interfere with scope optics. $2.95 *per pair*

PISTOL GRIP ADAPTER

Improve your hand-gun shooting by installing, in a few minutes, our well-known grip adapter. When ordering, specify gun to be installed on and we will send the correct size. $1.75

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RIFLEMAN WORDS • • • •

Each month this 'lexicon for shooters' is devoted to a few words peculiar to the shooting game which may be puzzling to the newcomer.

ANNEALING—Heating and slow cooling to increase ductility or remove internal stresses; applied to metals and glass.

BENCH REST—A means for securing maximum accuracy with rifles. It is constructed as a table which permits the shooter to sit comfortably with both elbows on the surface and the barrel or forestock resting on a specially-built support or sandbag. Bench rest shooting is designed to minimize or eliminate as many of the human errors as possible, and test the accuracy of the rifle and ammunition only.

BENT—A notch (commonly in the hammer) in which the trigger or sear is held engaged, under the tension of the mainspring, until withdrawn by the action of the trigger.

BUFFER—A part intended to absorb shock or check recoil.

GRIP ADAPTER—A filler fitting back of the trigger guard of a revolver to lower the point of contact between the gun and the shooter's hand.

HAMMER SPUR—On exposed-hammer weapons, the spur, or projection rearward, which provides a gripping surface and leverage to cock the hammer.

HAND—A long, thin, steel unit so mounted in the lockwork of a revolver that it engages a projection near the center of the cylinder face and revolves the cylinder the distance of one chamber as the hammer goes to full cock.

HANGFIRE—Delayed ignition of the powder charge. Unpredictable, usually unexplainable, often dangerous, a hangfire may last many seconds from the time the firing pin strikes the primer until the gun discharges.

LINE OF SIGHT—The straight line from the shooter's eye through (or over) the sights of the gun to the target.

MISFIRE—Absolute failure of the cartridge to fire after the primer has been struck by the firing pin. Not to be confused with 'hangfire'.

OVERSTRESSING—Subjecting metal to stresses exceeding the elastic limit of the metal with resulting permanent deformation.

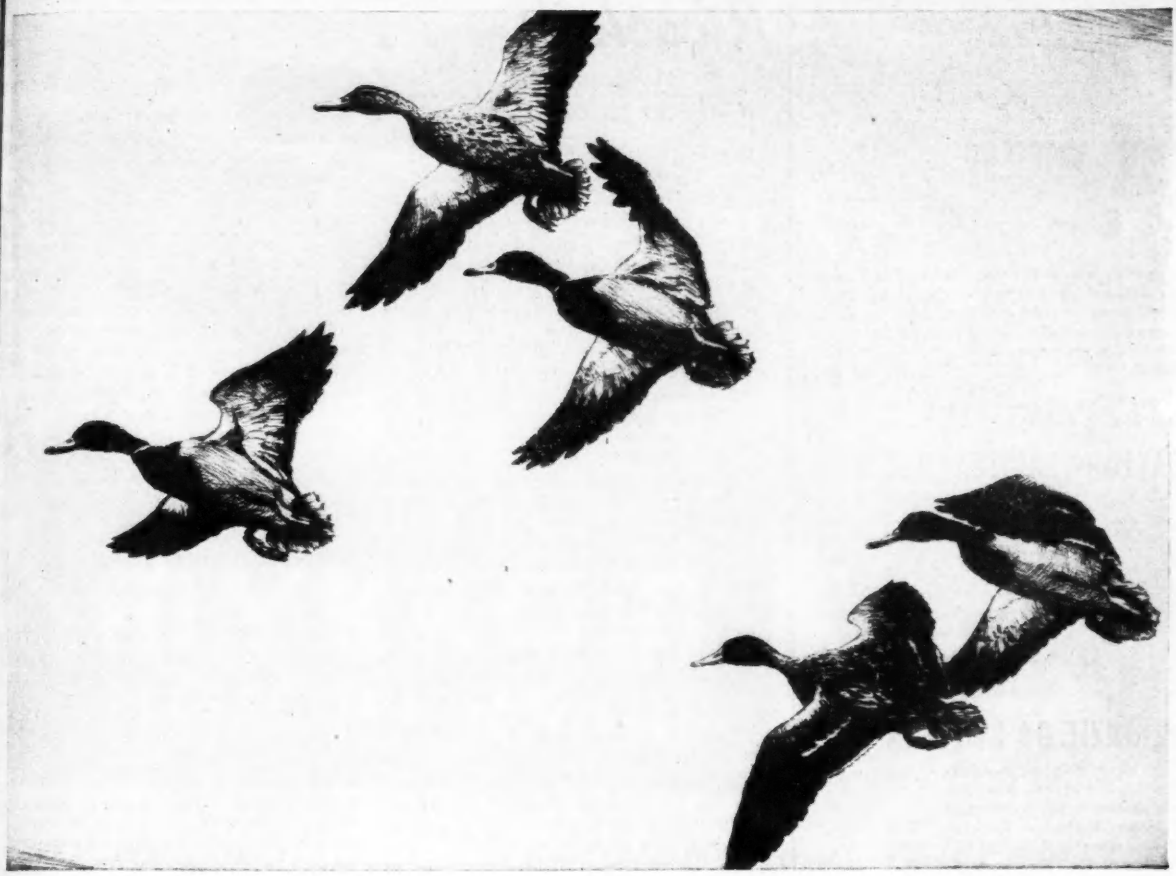
PARKERIZING—A patented process for forming a rust-resistant coating on iron or steel by immersing in a hot solution of acid manganese phosphate.

PATTERN—Form, usually made of wood, around which sand is tamped to form a mold for the casting of metal.

SELF-HARDENING STEEL—Steel, e.g., tungsten steel, that hardens without quenching after forging.

SHOT—Metal formed into small, essentially spherical units by allowing drops of the molten metal to fall from a height into water; in the case of lead, from which most shot is made, approximately one percent of arsenic is added to facilitate perfect formation of the spherical shape.

STAINLESS STEEL—Series of high-chromium steels, frequently with nickel as an additional alloying component; resistant to air, oxidizing agents, and other corrosive influences.



"MALLARDS IN FLIGHT"

by Hans Kleiber

The decoys are set, the hunter crouches . . . watchful . . . waiting. Then, silhouetted against scudding autumn clouds, the first dark specks appear. They grow larger, and larger still. Suddenly they swerve. Mallards . . . and they're coming in!

These are moments a hunter lives for. Unfortunately, in many places, they're becoming fewer and farther between. Today, it's the responsibility of all true sportsmen to take positive action—now! To preserve wildlife, limit your bag. Join and support local and national organizations for game restoration and conservation. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.

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FREE BOOKLET ABOUT SHOOTING

Write today for information on how to start a rifle club in your own community . . . how to teach your group to have more fun shooting a rifle . . . how they can win Ranger Shooting Emblems. No obligation. Address—Sportsmen's Service Bureau—Dept. A5, Sporting Arms & Ammunition Manufacturers Institute, 343 Lexington Ave., New York 16, N. Y.

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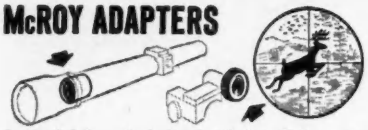

A special Bausch & Lomb "Balcote" lens that gives sharper, more definite contrast, making your target stand out vividly against a blending background. Like sunshine on the target on dark days. Sizes for every scope—peepsights, too. Easy to install. (each, post paid) $7.50

Scopes McRoy equipped: Alaskan, $67.50; Bear Cub, $62.50; K25, $45; K4, $52.50; K6, $55.50.

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Mark II for Enfield, Springfield, Mauser alterations. Fast, smooth, positive ignition. Cocks on lift of bolt. 5/16" travel on Enfield; ¼" travel on Springfield and Mauser. Positive safety operation. No welding.

Speedlock (post paid) $15.00

Single-stage (post paid) $12.50

McKINZIE QD SWIVELS

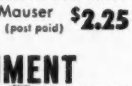
The sensational new quick-detachable swivels. Positive locking ball bearings released by pushing the button. Precision made—guaranteed against mechanical defects. Easy to install.

Complete set..... (post paid) $3.50

McKINZIE RAMPS

Highest quality steel, precision-made to fit your barrel. Attractive design. For Springfield, Enfield, Mauser (post paid) $2.25

BUDDY QD ATTACHMENT



Q-D scope mount attachment for Redfield, Jr. and Buehler mounts. Converts them to a really "quick" detachable mount, no tools required. (post paid) $3.00

BULLET PROTECTORS

Protect bullet points from recoil, prevent magazine jams. Insure greater accuracy. Fit Springfield, Enfield, Winchester and Mauser..... (post paid) $1.15

PRIDE BARRELS

Finest Chrome-molly steel, 6-land, skillfully made. Chambered and fitted to your action. All standard calibers. An accurate barrel. (express collect) $45.00

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Ricochets . . .

WEATHERED STOCKS

Macksville, Kansas

Editor:

Dyer's article, "You Don't Buy Accuracy" in June issue, strikes directly to the heart of a problem which confronts shooters everywhere. Having only the first issue at hand, I believe the conclusion will no doubt show victory over his 'battle of the barrel'.

Another article in a few months might possibly show said victory to be short-lived, as I have fought this and temporarily won for four times in the past sixteen months. The outcome is not permanent as an extremely wet season of weather, or dry and hot, will take its toll of the precise fit so tediously achieved.

I think the answer is in the use of some other material than wood in the stocks. Tenite I believe would do the trick or possibly aluminum, with hollowed buttstocks if weight was too great. Additional weight in buttstocks has shown to be of aid in preventing low shots standing.

The manufacturers are selling us down the river in not developing some better stocks. No one minds a little hard work if the results are permanent, but this will-of-the-wisp is short-lived, unless weather is stable.

We're paying for all this so why not develop something we can depend on. I'd also plug for an abutment shoulder on the receivers to take recoil rather than the pair of stove bolts now being used.

Why, oh why, doesn't some one come up with a precision gunstock that resists weather changes?

RAYMOND E. AYERS

PHYSICS AND ANATOMY

Baltimore, Md.

Editor:

Wow! How could you have been so cruel to Alexander C. Johnson, M.D. After publishing "Momentum, Energy, Power" by Major Ralph W. French in the May issue of the RIFLEMAN, in which the conclusions of apparently carefully conducted experiments proved that the size (volume) of a wound is directly proportional to the energy expended in creating it, you let poor Doc Johnson, who probably never had a chance to see the article, crawl right out to the end of a broken limb!

What I am hinting at is, Doctor Johnson makes no attempt to differentiate between penetration and severity or greatness of wound.

DONALD M. MELVIN

● *In the letter which accompanied the final corrections of his article, Dr. Johnson says: "The article by Major Ralph French dovetails very nicely with my article, as he deals principally with the physics involved while I tried to emphasize the anatomic and physiologic side of the problem. I noticed that he, too, particularly emphasized the importance of velocity, provided the missile does not disintegrate, in the production of a tissue wound. By way of explanation, before someone points it out, it should be noted that I did not separate the compression wave from the secondary decompression, produced by the passage of the missile wave, since t are inseparable, and I wished to avoid much detail. While the decompression w is probably largely responsible for the travasation of blood, I believe Major Fr excessively minimizes the effect of the c pression wave transmitted through a f and therefore a practically incompres medium. It is my impression that when bone is fractured by a missile passing n it, the direction of the fracture is more lik away from the missile tract. Microsco x-rays also have shown the tremendous d placement of not only the fractured bone, also of nerves and blood vessels (injec with x-ray opaque substances) away fr the missile tract. Such displacement, noted, could hardly be regarded as a min consideration in evaluating the effect of t missile."*

WESTERN CHUCKS (Continued)

Spokane, Washington

Editor:

Taber's article, "Chucks, Western Styl (May) was certainly enjoyable. Doubtl there will be skeptics. In support of Tabe impressions of Colorado chuck shooting would like to point out to the doubtful rea er how we go for them here in the Paci Northwest.

The mile-deep canyons of the great Sna and Columbia Rivers out here are a ch lenge. We bounce down over the many r pids in rubber life rafts and lie flat on o backs with our favorite combinations of rif load and scope. We pick them off the hig rim rocks 1500 to 1800 yards away, straig up. (The U. S. Bureau of Reclamation elev tion bench marks give us an accurate che on this perpendicular range.) The edg of the life raft makes an excellent and cu hioned mounting for the spotting scope. W perhaps have one advantage over our Colo ado brothers, however, which enables us t get them at these longer ranges. In shootin straight up, the effect of mirage is advantag eous, like adding several grains of powde to an already hot load.

Yes, indeed, we in the remote Pacif Northwest take our chucks at long range with accuracy equal to that of our friend out west in Colorado.

EVERETT H. THOMAS

MEANING OF TARAGE

Wilmington, Delaware

Editor:

Looking over some recent copies of the RIFLEMAN in a moment of relaxation (of which there are too few), I ran across a couple of things I would like to bring to your attention.

On page 2 of the May issue . . . you say that the tarage table converts time interva to velocity readings, when, in fact, tha term is used, so far as I know, only to con vert remaining length of copper crushe cylinders to pressures.

Also, I have read with much interest some of the articles that Barr has been preparing on reloading. You can guess my reaction when he referred to our Hi-Vel No. 2 as one of "those older powders" that are out of date. It is an older powder all right, but it

The two parts of the MYKROM Mount are precisely aligned by the *Inter-Plane Lock.*

$14.85

Only the new MYKROM TELESCOPE MOUNT

has the accurate Inter-Plane Lock

Instantly detachable and replaceable at absolute zero—with *micrometer accuracy*

Once your MYKROM-mounted scope is zeroed-in, you can detach it and replace it instantly and accurately—thanks to the patented *Inter-Plane Lock*.

The *Inter-Plane Lock* is the revolutionary new principle of automatically aligning two objects with micrometer accuracy. It consists of two identical parts—one on the upper section of the mount that holds the scope, and the other on the lower section, secured to the rifle.

These identical parts are designed and machined so that they always fit together in the same precise alignment. Thus, the *Inter-Plane Lock* returns your scope to absolute zero each time it is replaced.

Always ready for accurate shooting

After your scope is zeroed-in on the range or at your gunsmith's, you can keep it detached for traveling or for protection from bad weather. Then, when you're ready to hunt, you can snap your scope into precise zero alignment almost as quickly as you can throw a shell into the chamber.

Thousands of tests have proved that there is no measurable variation in zero alignment when replacing a MYKROM-mounted telescope.

No tools. No calculations. A simple twist of the locking cylinder (*the one moving part*) locks or unlocks the MYKROM Mount.

The MYKROM Mount was developed by a group of machine tool engineers, who have hunted together for years. They wanted a mount with simple, accurate zero return, so they made one for themselves and now for *you*.

See the MYKROM Mount at your gunsmith's or sporting goods dealer. If he doesn't have them in stock send us his name and address, and we will send your MYKROM Mount to him. Mykrom Company, 1335A S.W. Morrison St., Portland 5, Oregon.

Write Today for Free Specification Sheet and Illustrated Circular.

RIGHT ANGLE MOUNTING—Zeroing-in is quickly done without disturbing internal elevation and windage adjustments of the scope. A gunsmith's dream.

LOW OVER BOLT—Scope is held as low as bolt permits.

STEEL FORGINGS—Drop forged of steel and finished to match the finest rifle. *Weighs less than 6 ounces.* Will mount any standard hunting telescope on the Winchester 54 or 70, Remington 30, 720, 721 or 722, Enfield and Springfield.

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PROMPT DELIVERY. Minimum Payments of Ten Dollars—
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Remington Model 721 Rifle, .30-06 and .270 Caliber	$ 79.95
Marlin Model 336A Rifle, .30/.30 or .32 Special Caliber	72.55
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Remington Model 31TC Trap Gun, 12 gauge, with Ventilated Rib	178.50
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Unertl Hawk, 4 power	52.00
Weaver K2.5, 2½ power	37.50
Weaver K4, 4 power	45.00
Weaver K6, 6 power	48.50
Weaver J2.5, 2½ power	22.50
Weaver J4, 4 power	27.50
Weaver G4, 4 power	9.75
Weaver G6, 6 power	12.50
Lyman Alaskan 2½ power	60.00
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* Stith, King-Pike and Redfield Mounts available

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Bausch & Lomb Prismatic Spotting Scope 60 mm Objective, 20X	95.00
Argus Super Spotting Scope	74.50
Freeland All-Angle Stand	11.50
Mossberg Spotshot	24.90
Mossberg Stand	11.90

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High Standard Model G-B .22 Cal. 4½ or 6¾" barrel	50.00
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High Standard Model G .380 Caliber Automatic 5 inch Barrel	55.00
Colt Official Police Revolver .22 cal. or .38 cal.	65.00
Colt Police Positive Special Revolver, .38 Special, .38 Police Positive or .32 Police Positive	65.00
Colt Detective Special Revolver .38 Special .38 Police Positive or .32 Police Positive caliber	65.00
Colt Officers Model Target Revolver, .38 Special or .22 Cal.	75.00
Colt Super .38 Automatic Pistol	65.00
Colt Government Model .45 Automatic Pistol	65.00
Colt .22 Conversion Unit for .45 and Super .38 Automatics	40.00
Colt Sport Model Woodsman Pistol	60.00
Colt Target Model Woodsman Pistol	70.00
Colt Match Target Woodsman Pistol	85.00
Smith & Wesson K-22 Revolver	65.00
Smith & Wesson K-38 Revolver	65.00
Smith & Wesson Military & Police Revolver 2, 4, 5 & 6" Bbl., .38 Caliber, Square Butt	56.50

TARGET SCOPES

Unertl Varmint Scope, 6, 8 & 10X	75.00
Unertl Target Scope, 1 inch objective, 8 & 10 power	58.00
Unertl Target Scope, 1½ inch objective, 10, 14 and 20 power	90.00
Unertl Target Scope, 2 inch objective, 10, 15 and 20 power	125.00
Litschert Spot Shot Target Scope, 1¼-inch Objective Lens, 10 or 12 power with Dust Caps and Recoil Spring	49.95
Fecker Target Scope, 1⅝ inch objective, 10, 16, 20 & 24 power	98.50
Fecker "Woodchucker" Scope, 1.2 inch objective 4.5, 5.5 & 7 power	62.50

BINOCULARS

(Prices shown include tax)

Bausch & Lomb Zephyr Light Hard Coated Lens	
6 x 30	186.00
7 x 35	186.00
8 x 30	204.00
9 x 35	204.00
7 x 50 (not Zephyr Light)	210.00
Kollmorgen "De Luxe" Monette Monocular	49.50
Suede Case for above	1.75
Ray Ban Shooting Glasses	15.00

NOW ACCEPTING ORDERS FOR FUTURE DELIVERY ON:

Winchester M/70 Rifle, Std. Grade, open rear sight. .22 Hornet, .250 Savage, .270, .30-06, 7mm, .257 Roberts, .375 and .300 Magnum, .220 Swift Caliber	109.50
Same, Lyman receiver sight	123.25
Super Grade, open rear sight	162.50
Same, Lyman receiver sight	176.25
Remington M/721 Rifle, .300 Magnum open rear sight	79.95
Remington M/722, .300 Savage & .257 Roberts Caliber	74.95
Stevens Model 322 Bolt Action Rifle, .22 Hornet caliber	42.95
Savage M/99EG Rifle, open rear sight, .300 Savage & .250-3000	96.45
Winchester M/52 Sporting Rifle with Lyman Receiver Sight	148.50
Remington Sportsman-'48 & M/11-'48 Autoloading Shotgun, 12, 16 & 20 gauge	99.95
Same with ventilated rib	119.95
Sportsman Skeet Grade vent. rib	124.24

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is the best if you want maximum accuracy and his own tests seem to indicate that.

HENRY N. MARSH, *Manager*
Smokeless Powder Division,
Hercules Powder Company.

● *Strictly speaking, tarage is an empiri table of compression of the copper (or lea cylinders which are used to determine int nal pressures in guns. However, the practi has grown in some ballistics laboratories also calling the data tables for chronograp tarage tables.*

The word is so used in Phil Sharpe's ticle on page 38 of the May RIFLEMAN. *It to explain this use that the definition written. Unfortunately, the definition a appeared was far from complete and sho have been amplified.*

As to Hi-Vel powder, the use of the te "older" certainly was not intended to im anything derogatory to that fine powd which is and always has been one of t best as to accuracy characteristics. It is no means out of date.—ED.

WORD OF PRAISE

Brooklyn, N. Y.

Editor:

May I put in a word of praise for the ge eral excellence of THE AMERICAN RIFLEM and the organization it stands for, of wh I have been a satisfied member for seve years now. I have discovered no other p lication that can begin to compare with in scope, authority or accuracy. A spe cheer for the Dope Bag . . .

THOMAS F. HARRIGA

HANDLOAD SERIES

Superior, Wisconsi

Editor:

Read and enjoyed very much Barr's ticles on loading the .30-'06, 38 Special .45 automatic! These are the most 'usea articles on the subject I have ever re

FRED M. SEGUI

SILVERTIP BULLETS

East Alton, Illinoi

Editor:

I suppose it has been called to your tention that in the April article on the W chester research laboratory there was error on page 16 where reference was m to a "180-grain Silvertip." This should h been 170 grain.

W. H. DEPPERMA
Olin Industries

ANTIGUN LAWS

Pasadena, Californ

Editor:

I want you to know that I am most preciative of the splendid work the N is doing to keep crackpot laws out of state law books. I feel that the mem would be willing to donate small sums, fifty cents or a dollar, to help keep this g work going. I know I would.

IRA N. Do

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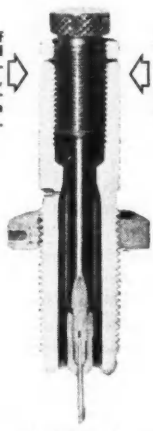

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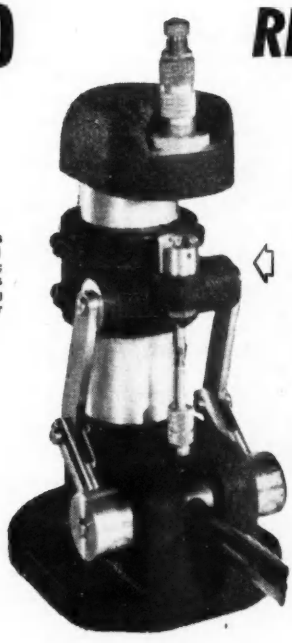

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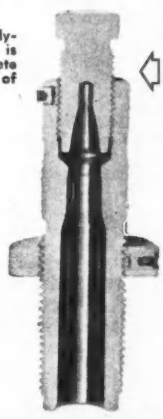

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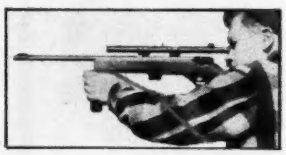

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Incidentally . . .

As you probably know, dyed-in-the-wool RIFLEMAN readers go through each issue with a thoroughness that's flattering to Editor and advertiser alike. Lately, though, some of our pals have been jumping the gun on us. They don't even wait to see what's inside the mag! One look at the cover is enough to make them dash for pen and postcard. It's about time their misdeeds were brought into the open. Just possibly, we may be able to shame them into letting us alone for a few issues. After all, mistakes happen on the cover of the *Saturday Evening Post* once in a while too!

A half-dozen correspondents (so far) have called our attention to the gentleman in the red shirt on last month's cover. You remember, the one who is lovingly holding a .220 Swift in his arms while his pardner (in a black-and-white checked job) scans the countryside for a woodchuck. All of this, in itself, is entirely permissible. However, the gentleman in the red shirt has his rifle sling on backwards. According to the six 'readers' who have called it to our attention up to now, a rifle sling installed hind-end-before is definitely not the sort of thing one does.

Unfortunately, there's not much we can do to remedy this lamentable situation. In the first place, we didn't take the photograph. It was taken by a fellow out in Michigan name of Milligan. More to the point, as far as we know the gentleman in the red shirt actually uses his sling backwards. He may even be one of those perverse fellows who deliberately puts his sling on backwards because he likes it that way. There's sometimes no telling what flimsy arguments people will use just so they can do things wrong end to. Also, we might as well own up to it. We didn't notice the sling until after the plates for the cover had been made and we wish you sharp-eyed guys would look at some other magazine and spot their mistakes once in a while.

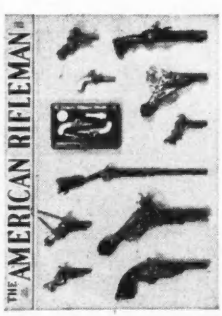
☆ ☆ ☆

That sling business has cropped up before. Back in April of last year we used a Kodachrome of a Marine with his Garand . . . and before we knew it, a large hunk of the membership had reminded us that this gun couldn't be much of a Marine because all Marines were super riflemen and this Marine had his sling slightly twisted. Well!

It reminds us of the time, a couple of years ago, that Dick Reish was photographing a Scottish pistol for the cover. It didn't take long to realize that our bright red backstrip would look like hell against the dark red plaid we planned to use as a background. Dick shopped for three days and finally located the perfect plaid . . . predominantly green and white. When he assembled the cover in the studio everything was fine. The pistol showed up well against the plaid and the colors didn't conflict with the red lettering we use on the cover. It was not until after the issue had been printed that we discovered the awful truth. Our fancy green plaid had never seen Scotland. It was the creation of some American designer, probably, who was anticipating just such problems as we ran into. Fortunately, as it turned out, there are not many plaid experts among RIFLEMAN 'readers', and we got away that time with just a couple of critical letters.

☆ ☆ ☆

Once, you'll be pleased to know, we got away scot free. It was early in the war, and we published a cover photo of a GI in battle dress, with M1, helmet and gas mask. At that stage most of us were still in civvies and didn't have the personal knowledge of military equipment we were later to acquire. Even so, someone should have known when a GI helmet is on backwards. No one called our hand, though, and to this day we have not been notified of our error. Officially, that is. We realized it, as usual, after the plates had been made!—J. S.



COVER

One day last winter the Rifleman editor was in New York, and called on Metropolitan Museum curator Stephen V. Grancsay. The conversation turned to miniature firearms and arms-enthusiast Grancsay had the Museum's collection of tiny firearms brought from storage. The cover possibilities were obvious and arrangements were made then and there. Here, from an 8 by 10 Kodachrome prepared by the Museum's photographer, are the best of the Metropolitan Museum's miniature firearms . . . and on page 28, a note on them by armor and arms curator Grancsay.

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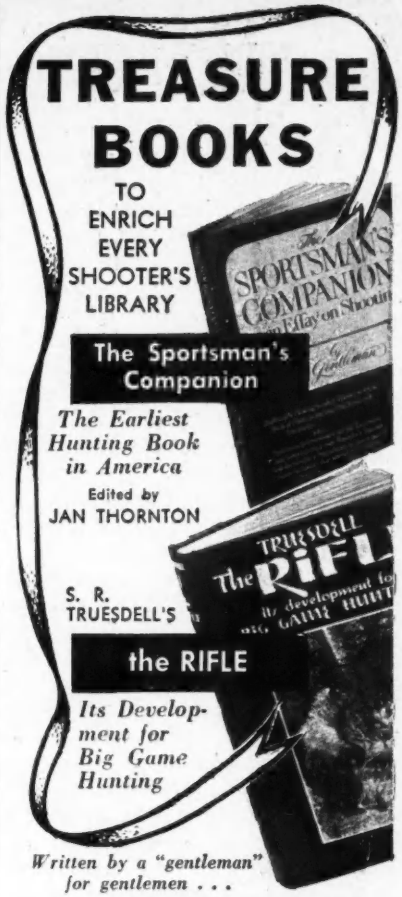

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TRUTH -- SELF EVIDENT

Ask the average American what we celebrate on the Fourth of July and he will reply, "We celebrate our independence from England." Ask how we gained that independence and the reply will be to the general effect that "Washington had a lot of frontiersmen who knew how to fight in the woods and the British didn't, so we licked 'em." All of which is a sad commentary on the teaching of the essentials of history to American youngsters.

In fact our national independence from England did not come until years after the Declaration of Independence was given the world on July 4, 1776. What we really celebrate is that ringing statement of a fighting ideal—"We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness. That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed . . . And for the support of this Declaration, with a firm reliance on the protection of divine Providence, we mutually pledge to each other our Lives, our Fortunes, and our sacred Honor."

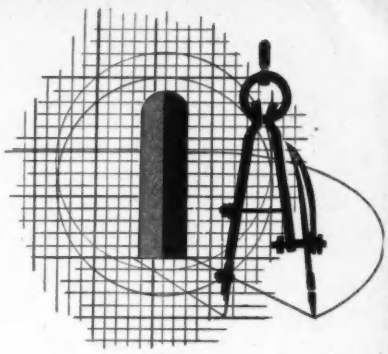
It was neither the amateur armies of Washington nor the professionals of the French which defeated the regulars and mercenaries of George III. The Americans won because the ideal which they publicized and dramatized with blood and sacrifice captured the fancy of men everywhere. In the Declaration of Independence the British people read the expression of their own hopes and aspirations, begun with Magna Carta five hundred years before, for the establishment of a government "deriving its just powers from the consent of the governed." King George III might have won a war abroad where the issue was to be decided by the best-trained troops. He could not win a war both at home and abroad where the issue was to be decided by an ideal—the ideal of the dignity and independence of the individual.

The real issue of the American Revolutionary War was not the political independence of the colonies from the mother country. The real issue was the political independence of the individual. The fight was not between the British people and the American people—it was between the idea that man exists for the benefit of the State and the ideal that the State exists for the benefit of the individual. It is the same battle that goes on today all over the world between the Communist and Fascist on one side and free men on the other side.

So let's get our thinking straight on this Independence Day. The message of the Liberty Bell ringing at Philadelphia on July 4, 1776 was listened to with rapt attention by men all over the world because it proclaimed the freedom of Man, not because it announced the freedom of a few colonies from the mother country. Always, heretofore, America has had to fight only physical aggression. Now, for the first time, the American ideal, the edge we have always held over our enemies, is under direct attack. The people of the world are being told that the whole clarion call of the Declaration of Independence was wrong, was rotten at heart, should be now buried and forgotten along with the men who died to establish and maintain it. Americans have always seemingly preferred eventual violence to eternal vigilance in guarding their liberties. But, as we celebrate Independence Day, 1949, we are engaged in a fight which cannot be won by armed force. Just as George III lost America because he depended on force of arms instead of force of ideals we can lose today's cold war by depending on the atom bomb and air force instead of teaching, preaching and living the American ideal. Nor can the job be done by Harry Truman, Dean Acheson, Tom Connally or Arthur Vandenburg. It has got to be done, brother, by John Q. Public, which is YOU and not two other guys!

C B Lister

the bullet's flight



DO FORMULAS FRIGHTEN YOU? IF YOU REMEMBER HIGH-SCHOOL ALGEBRA, HERE'S YOUR MEAT. THE FIRST OF THREE EASY-TO-UNDERSTAND ARTICLES ON BALLISTICS

BY PEYTON AUTREY

MANY OF THE PROS and cons among shooters, handloaders and experimenters would be better understood if more attention were given to the fundamental physical factors of the bullet's flight. A bullet, including the one fired from the latest super-velocity wildcat, obeys the same physical laws of motion as the rock thrown by the hairy arm of prehistoric man.

The dictionary defines physics as the "science of the principles operative in organic nature; the science of forces and forms of energy". We are concerned with a branch of physics known as mechanics or the science of motion.

Sir Isaac Newton, in the latter part of the 17th Century, made the most progress in discovering the laws of motion by working with pendulums, apples and other gadgets. He is said to have awakened to the possibilities of a law of gravity by the unceremonious clonk of an apple on his head while snoozing in the orchard. Let us not 'pooh' the story, however, in spite of the fact that man had known for many centuries previous that he and other objects were ground-bound. The fact that the acceleration of gravity is 32.2 feet per second per second is on the other hand invaluable to us. Newton was a pioneer physicist.

Newton's three laws of motion are:

(1) Every body continues in a state of rest or a state of uniform motion in a straight line, unless compelled by external forces to change that state.

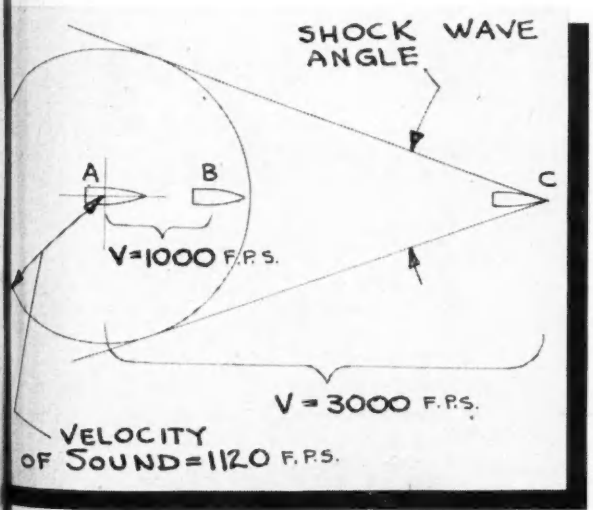


Fig. 1: Bullet in motion constantly radiates sound wave. The angle of the wave front is determined by the relative speed of the bullet and the speed of sound and consequently is an indication of bullet velocity

(2) A change in momentum of a body is proportional to the force imposed upon it and takes place in the direction which the force acts.

(3) A force is always accompanied by an equal and opposite reaction.

By Newton's first law it may be seen that any body in motion, unless acted on by some force, will continue at a constant velocity in a straight line. If a force is applied to a body moving at constant velocity, the body will be accelerated in the direction of the force. Acceleration is the *rate of change of velocity under* the condition of applied force, and it is usually expressed in feet per second per second (or feet per second squared).

A bullet at rest in the chamber of a barrel is brought to a state of motion by the gas pressure of the burning powder. The pressure is resolved into a force on the base of the bullet equal to the product of the bullet's cross-sectional area and the pressure. The bullet is thus accelerated rapidly until it reaches the muzzle, at which instant the gas escapes around the bullet and the accelerating force therefore completely disappears. The bullet has no propelling force upon it and therefore no acceleration, but it has attained velocity.

According to Newton's first law, the bullet will hold the velocity if it is not acted upon by external forces. However, any body in rest or in motion is acted upon by the force of gravity. Another force on the bullet is that due to the resistance of the air. The bullet is simply colliding with a multitude of air particles which impart a decelerating force on the bullet in the same way the gas pressure exerted an accelerating force in the barrel, except, unfortunately, the force is in the opposite direction.

The force required to accelerate an object of a given weight, such as a bullet, is equal to its *mass* multiplied by the acceleration or, to use engineering language, $\mathbf{F = ma}$ where **F** is the force, **m** is the mass, and **a** is the acceleration.

Let us try to clear up the matter of *mass*. Going back to Newton's first law, we remember that a body will continue in a state of motion in a straight line unless compelled otherwise by external force. Gravity is an external force. Therefore, in order that the laws of motion may be written independently of gravity, the mass unit is used. From the above equation of the force required to accelerate a body of given mass, it is readily apparent that the weight of any body will be the force (on a set of spring scales for example) produced by the mass times the acceleration of gravity. Since the acceleration of gravity is 32.2 feet per second per second, the mass unit is approximately 1/32 of one pound of weight. This unit is sometimes referred to as the poundal or slug. We can re-write the equation then by representing the mass as the pounds of

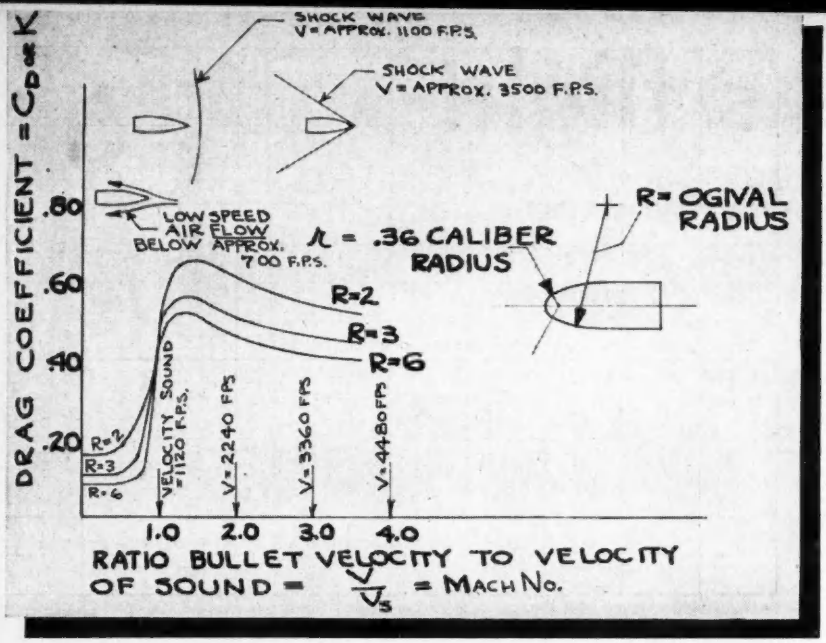


Fig. 2: Value of drag coefficients varies with ratio of bullet velocity to velocity of sound. Shape of bullet also affects value of drag coefficient

weight of the body divided by the acceleration of gravity (32.2) which is always designated as **g**.

$$F = \frac{W}{g} a$$

where **W** is the weight of the body in pounds, **g** is the acceleration of gravity, and **a** is the acceleration of the body. Since the unit of weight used in small-arms ballistics is in grains, we will convert the weight in pounds to grains. There are 7000 grains to the pound, therefore to keep the mass at the proper ratio we simply multiply **g** in the above equation by 7000, remembering always to use grains for bullet weight and not pounds. Then we get

$$F = \left(\frac{w}{225{,}400}\right) a$$

We can also find the acceleration of a bullet caused by any force by simply solving for the acceleration in the above equation. Then we have

$$a = \frac{225{,}400\ F}{w}$$

Thus, a bullet weighing 225 grains being propelled through a barrel by a force of 1000 pounds, would be accelerated at the rate of over 1,000,000 feet per second per second. In a barrel the accelerating force behind the bullet would actually be the net force—or the gross force due to gas pressure minus the resistance force of the bullet in the rifling. The resistance of rifling is obviously a small fraction of the accelerating force, unimportant to the main purpose of this article, and therefore can be ignored. Also we have assumed the pressure constant, or rather have used an average, since the pressure increases and then decreases as the bullet progresses through the bore. The distance or space covered by a body with a given acceleration is a function of time and acceleration $d = \frac{1}{2}at^2$ where **d** is distance in feet, **a** is the acceleration in feet per second per second, and **t** is the time in seconds. The muzzle velocity in the example can be found by solving for the time the bullet is in the bore, since the velocity equals the acceleration multiplied by the time, $V = at$.

Solving for **t** in the distance equation,

$$t^2 = \frac{d}{\frac{1}{2}a}$$

$$t = \sqrt{\frac{d}{\frac{1}{2}a}}$$

The time of the 225-grain bullet through the bore in the example case would be for 24-inch (two foot) barrel

$$t = \sqrt{\frac{2 \times 2}{1{,}000{,}000}} = .002 \text{ second}$$

Since $V = at$, then the muzzle velocity

$$V = 1{,}000{,}000 \times .002 = 2000 \text{ f.p.s.}$$

As a bullet exits from the muzzle of a rifle, the acceleration of gravity causes it to fall in a curved path below the axis of the bore. Also as the bullet leaves the muzzle it is accelerated in the opposite direction to its motion by a force caused by resistance of the bullet with the air.

The negative acceleration due to air resistance is sometimes termed deceleration or retardation. Let us study the force due to air resistance as it is very important. The force is generally called drag by most aeronatuical engineers and ballisticians.

Sir Isaac Newton seems to have been the first to consider the effect of air resistance. He found, by dropping spheres of varying density from the heights of St. Pauls Cathedral, that the retardation, therefore the drag, varied in proportion to the square of the velocity. The drag of any body follows a fundamental law of fluid dynamics

$$D = KA \frac{P}{2} V^2$$

where **D** is the drag in pounds, **K** is a coefficient which depends

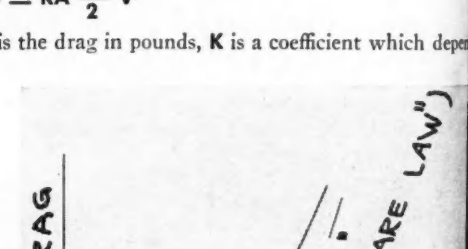


Fig. 3: Rapid increase in drag occurs as bullet velocity approaches speed of sound. Above speed of sound, rate of drag increase becomes relatively slower

upon the shape of the bullet, **A** is the cross-sectional area of the bullet in square feet, **p** is the mass density of the air or the density of the air in pounds per cubic foot divided by the acceleration of gravity, and **g** = 32.2. The density of air is .07651 pounds per cubic foot. The mass density in slug units of mass, as previously explained, is therefore

$$\frac{.0765}{32.2} = .002378 \text{ (Slugs per cubic foot)}$$

V is the velocity and is squared in the equation. An explanation of the $\frac{p}{2}V^2$ term, usually referred to as dynamic pressure, is that it is a representation of kinetic energy of the relative air around a body. Kinetic energy is $\frac{1}{2}mV^2$. Since **K** is a coefficient of shape which is derived from test, it corrects the shape from what otherwise would be a flat plate. Much data has been compiled on the coefficient of shape in the past.

Going back to the bullet acceleration equation, we can find the retardation of the bullet. **F** in that equation will be the drag or air resistance force. Then the retardation in feet per second per second becomes

$$a = \frac{225{,}400D}{w} = \frac{225{,}400\ KA\frac{p}{2}V^2}{w}$$

and converting the area to square inches (144 square inches to one square foot),

$$a = \frac{225{,}400\ \frac{1}{144}\ KA\frac{p}{2}V^2}{w} = \frac{1560\ KA\frac{p}{2}V^2}{w}$$

From this equation it can be seen that a bullet has a low value of cross-sectional area, **A** (small caliber), and a high weight, will have a low retardation, assuming that the shape or drag coefficient is constant. Sometimes called sectional density, it is merely the weight of the bullet per unit of cross-sectional area (grains per square inch). Sectional density is sometimes combined with the drag coefficient to give what is termed ballistic coefficient. The retardation can be put in terms of sectional density, $\frac{w}{A}$, as follows:

$$a = \frac{1560\ K\ \frac{p}{2}V^2}{w/A}$$

However, we are more interested in the physical workings of the trajectory of the bullet and neither space nor the risk of confusion will permit us to condense the equations. The intention here is to make the basic significance known to the reader. The sectional density is a major factor for comparing bullets of various calibers and muzzle velocities. Keep it in mind.

Now for the coefficient of drag, **K**. First, let us say that there is no basic physical significance to the factor **K** and it may be used in various ways. It may be converted for use with the surface area of the bullet instead of the cross-sectional area or it may be based on the area of *anything* as long as the proportionality of the equation is maintained and the drag force is the same for a given bullet at a given velocity and air density. The factor **K** is therefore only relative. It may sometimes be corrected to use the square of the bullet diameter and the weight density of the air, thereby condensing the retardation equation to a formula for ready application. We are concerned, however, only with the basic mechanics of the bullet trajectory. As we use it, **K** will be the basic value used in fluid dynamics and based on the cross-sectional area.

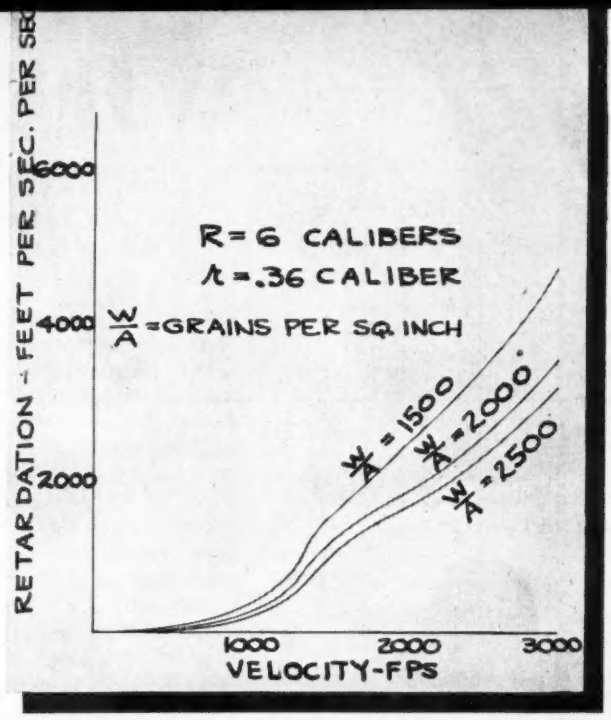


Fig. 4: Curves show that the higher the sectional density of a bullet, the greater is the decrease in rate of retardation above velocity of sound

In 1742, Benjamin Robins, a student of gunnery, fired projectiles against a pendulum at distances up to 250 feet and at velocities up to 1700 feet per second. He found that Newton's conclusion was substantially in agreement and that the drag and retardation varied as the square of the velocity. However, at velocities above 900 f.p.s. a greater discrepancy appeared in the retardation results than was indicated by Newton. The discrepancy was due to the formation of a wave front or shock wave on the bullet occuring just below, through, and beyond the velocity of sound (1120 f.p.s.). All of us have seen sparkograph or Schlieren photographs of bullets at supersonic velocity and the familiar shock wave which appears. The angularity of the wave front may be explained by Fig. 1.

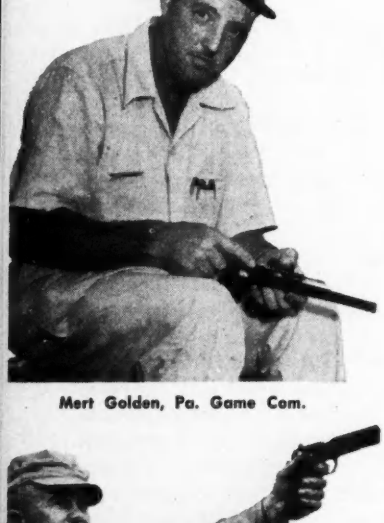
A bullet in motion is constantly radiating air pressure or sound waves in all directions. Since the bullet itself has velocity, there is a relation between its velocity and that of sound. It may be thought of as "in pursuit of the segment of sound wave ahead of and created by itself." In Fig. 1 a bullet at point A with a velocity of 1000 f.p.s. will travel 1000 feet to a point B in one second. In the meantime, the sound wave created at A will have radiated 1120 feet in all directions in one second, leaving a wave front similar to that on the medium velocity bullet pictured on Fig. 2. The reader has undoubtedly observed published sparkographs of bullets having such a wave front when the velocity is 1120 f.p.s. or less. On the other hand if the bullet at point A has a velocity of greater than 1120 feet per second, say 3000, it will travel 3000 feet in one second to point C or far beyond the sound pressure wave propagated by itself at point A. The wave front angle is the angle of a line drawn from point C to the tangency point of the sound pressure wave radius. The greater the velocity, the smaller will be the wave angle. If a velocity and retardation test is made of a bullet in flight by a chronograph or other means, so that it is possible to figure back to the drag and thus to the value of **K** for various velocities, it will be possible for us to plot a curve of *(Continued on page 46)*

WHAT MAKES A

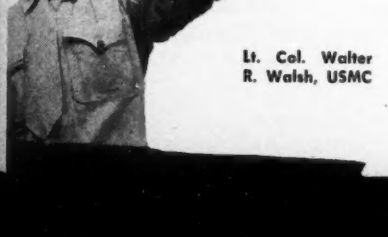
By Colonel A. M. Libasci, USA

T/Sgt. Joe Benner, US Army

Francis O'Connor, Kansas City policeman



Mert Golden, Pa. Game Com.



Lt. Col. Walter R. Walsh, USMC

WE'VE ALL WONDERED, consciously or subconsciously, as we go from tournament to tournament, why the same group of familiar names appears to monopolize the coveted gold medals and valuable trophies year after year. What manner of men are the champions? Are they favorably endowed by nature? Do they have superior equipment or are they in possession of highly secret information? To attempt to shed some light on these questions and some others, questionnaires were sent to the best of the top-flight pistol competitors in this country. Based on the questionnaires of thirty-five of the finest target pistol shooters, this article is an attempt to analyze the variable factors, animate and inanimate, that underlie and influence success in the highly competitive pistol shooting sport.

Let us take a minute and describe the laurels of this coterie of champs. Among the thirty-five shooters are all eight current regional champions (Chow, Reeves, Larsen, Barrier, Woody, Densford, Porter, and Walmsley) and nineteen of the twenty-four 1948 National Championship finalists. The group includes all of the first sixteen high scorers in the 1948 Nationals and all but one of the first ten in the 1947 National Matches. Members of the group are holders or co-holders of all but one of the national outdoor pistol records. Five of the six 1948 Olympic participants are represented (Walsh, Benner, Brooks, Roettinger and Chow). All members of the renowned Detroit and Los Angeles Police Teams are included. The current and deposed National Champions are also represented.

How good are the men as a group? All but three of the hot shots averaged well over 2500 in three-caliber aggregate scores during 1948. The group average three-caliber score, based on the best performance of each from available records of all re gional and some state tournaments in 194 is 2535. We believe the men listed rep resent the truly great modern crop of pistol champions. Such, then, are our 'guine pigs'.

As for the questionnaire, it is a rathe lengthly and formidable document. In general the questions cover physical makeup experience, practice and match shooting methods, and preferences and details o equipment used. Those who returned the questionnaire gave their answers freely an completely and seemed intensely interested in seeing the results. We believe some o the findings are startling, others highly informative, and still others of definite in terest to all shooters whether competitors or not. This factual digest we believe, may debunk some of the hokum extant concern ing the medal winners.

The first item we will consider is the matter of the occupations of the thirty-five select shooters. Are the ranks of the high scorers monopolized by the military and police? Of the thirty-five, sixteen are police officers, seven are members of the military and twelve are civilians. Hence twenty three out of the thirty-five, or about sixty six percent, are men whose profession require familiarity with firearms. How about comparative skill of the latter com pared with the civilians? Based again on the best three-caliber aggregate scores made during 1948, the average for the twenty three military and police shooters is 253 and for the twelve civilians it is 2528. Ad ditional research reveals that of the first ten ranking shooters in the 1948 National Championships four are police officers (Reeves first, Porter fourth, Millican sixth

This article is based on questionnaires sent to the following top-flight pistol shooters:

Huelet L. Benner	Charles F. Logie	Phil C. Roettinger
Thurman E. Barrier	Ellis Lea	Pat Slavens
Frank Borneman	Ralph B. Larsen	Paul C. Spavor
Quentin T. Brooks	M. LaLonde	W. R. Stark
Bob Chow	Robert J. Mansell	Basil Starkey
Charles F. Densford	Roy D. Marshall	Frank Stubits
R. W. Fisher	Donald R. Millican	William Sullivan
Mert J. Golden	A. M. Murray	V. J. Tiefenbrunn
F. E. Hudson, Jr.	Francis M. O'Connor	W. T. Toney, Jr.
Al W. Hemming	John W. Porter	Walter R. Walsh
Emmett Jones	Harry Reeves	J. N. Woody
Jens B. Jensen		Ed Walmsley

STOL CHAMPION?

PHYSICAL MAKE-UP, EQUIPMENT, AGE OR MATCH EXPERIENCE? A SURVEY OF FACTORS WHICH MAKE PISTOL MATCH WINNERS

and Walmsley ninth); four are members of the military establishment (Benner second, Walsh third, Densford seventh, and Barrier tenth); and but two are civilians (Woody fifth, and Logie eighth). Let the evidence speak or itself!

Before anyone draws false and unfair inferences, let it be firmly said that personal experience has definitely convinced us that the military and police do not have much advantage over the civilian as far as opportunity and time for practice. These men, in most instances, do not draw ammunition in unlimited quantities nor do they get free 'shooting irons'. They buy or reload their ammo and pay for their shooting equipment even as you and I. It is highly comforting to see the ranks of our best shooters swelled with a good representation of the military and police.

The average age of the group is a startling 39.6 years! The average age of the first five ranking shooters in the 1948 Nationals is 40.4 years (Reeves 38, Benner 31, Walsh 40, Porter 43, and Woody 50). The average of the members of the Detroit Police Team is 41.5 years (Reeves 38, Porter 43, Hemming 44, and LaLonde 41); and of the Los Angeles Police Team exactly 46 years (Jones 48, Starkey 48, Slavens 48, and Stark 40). Among our group of thirty-five there are only three shooters under thirty years of age (Brooks, Logie and Borneman); six are between thirty and thirty-four years old; nine are between thirty-five and thirty-nine; fifteen are in their forties; and two are fifty years old.

The evidence clearly indicates that maturity and seasoning are prime factors in the making of pistol champions. There is no short cut to the aging of experience. It takes years and many matches 'under the belt' to be able to steadily knock out the high scores the shooters produce. Another explanation may be that the shooters who do not achieve some degree of success drop out of the sport before attaining an advanced age, whereas the champs stay with it longer. In any event we feel that the fact that most of the good shots average around forty years of age is a very significant finding, to be kept in mind by all of the young rank-and-file shooters when in the depth of discouragement and frustration.

Physically the champs are stalwarts. Their average height and weight is five feet eleven inches and 187 pounds. The extremes of height range from five feet six inches to six feet five inches; of weight from 155 pounds to 230 pounds. Fifteen are six feet tall or more, and ten weigh 200 pounds or more. Only six are less than five feet ten inches tall and weigh less than 160 pounds. The fact that the group consists of big men physically is partly because approximately sixty-six percent are members of the police and military. The group is definitely overweight. Based on ideal medical standards for height and age, two of the group are ten pounds or more underweight; nine are ten to nineteen pounds overweight; eight are twenty to twenty-nine pounds overweight; and four are thirty or more pounds overweight. Only twelve are within ten pounds of the ideal for their height and age.

In spite of the obvious fact that the shooters are inclined to be overweight, five stated they considered themselves very fit; twenty said they were above average fitness; and ten appraised their physical fitness as average. These, of course, are self-appraisals only. None of the group appeared in the below average or sickly designation.

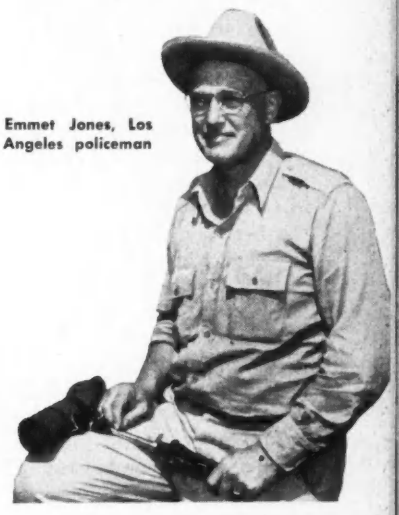
As can reasonably be expected from this group of big men, their hand sizes are in proportion. Twelve stated they had hands larger than the average; nineteen thought they had average size hands; and only four described their hands as smaller than average.

Is it true that the pistol champs are iron-nerved, stolid, phlegmatic, 'ice water in the arteries', dull machines with not an ounce of 'nerves'? Our boys are anything but! Again by self-appraisal, three stated they were nervous and fidgety; twenty-five thought they were average; and only seven believed themselves to be cool and phlegmatic. Nothing startling in this distribution. Obviously the group as a whole is not much different than the rest of us in nerveous makeup. If they have better self-control (and there is no doubt that they do), it was gained by experience and self-discipline, not by inheritance.

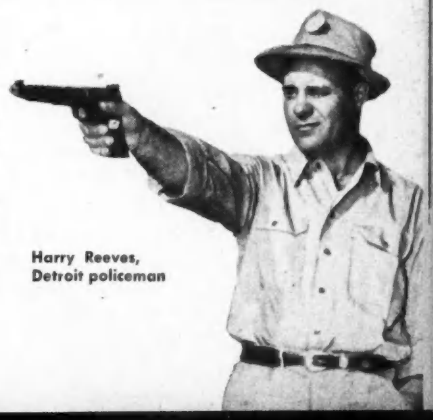
The idea sometimes is voiced that one doesn't have to be a moron to be a good pistol shooter but that it helps. Our group of shooters is far from being dimwitted.

Phil Roettinger, Colt Mfg. representative

Capt. Thurman Barrier, USMC



Emmet Jones, Los Angeles policeman



Harry Reeves, Detroit policeman

Of the seven military men one is a sergeant, one is a captain, two are majors, two are lieutenant colonels, and one is a colonel. Among our sixteen policemen are two captains, six sergeants, one corporal, one state policeman and one U. S. border patrolman. Among the civilians three are representatives of firms dealing in handguns or ammunitions, two own business establishments, one is a research analyst, one an engineer, one a medical student, and one a top-notch gunsmith. Our group is definitely above the average in intellect, thus exploding the moron theory.

How about visual acuity? What would you expect in this age group averaging about forty years and with seventeen men forty years old or over? Of our thirty-five champs, nineteen—or more than half—wear corrective lenses, eleven for farsightedness, five for nearsightedness, and three for astigmatism! About half of the far- and nearsighted group also have correction for astigmatism. Three of the members of the Detroit Police Team, including the National Champion, and all four members of the Los Angeles Police Team wear corrective spectacles. Our group is definitely not gimlet eyed. Apparently adequate compensation has been made by these men that enables them to make fine scores with less than average vision.

How about the modern vices of smoking and drinking? Our men are definitely not habitues of the 'filthy weed'. Only one confessed to being a heavy smoker; eight are average smokers; four said they were very light smokers; and, amazingly, twenty-two do not smoke at all! The proportion of nonsmokers of sixty-three percent is many times higher than in similar age and sex groups of the general population. These shooters probably believe smoking is not consistent with making good scores. Two of the smoking group stated they did not smoke during tournaments. Obviously, the question is too complex, and to discuss it further is beyond the limits of this survey.

About alcohol, eleven said they were moderate drinkers, twenty are very light drinkers, and four are total abstainers. In answer to the question, "Do you use alcohol in any form during match shooting?" a disarmingly frank group of replies was elicited. Ten confessed to drinking beer (for refreshment); six stated they used beer or whiskey at times (of these one also mentioned tequila); and nineteen denied the use of alcohol in any form. Thus only six of the group admitted using hard liquor, and these not routinely. As with tobacco this is a highly controversial subject and we will not attempt any physiological discussion here.

As for coffee, four are heavy coffee users, twenty drink it in moderate quantities, and eleven do not use it at all. Three of the coffee users do not drink it during tournaments.

Matters related to vision have always been so closely related to shooting that three additional questions were put to our shooters:

1) Do you try to protect or spare your eyes by cutting down on reading or movies? Only five answered affirmatively.

2) Do you use a peep disc on your spectacles? Only six use a peep and of these three use it indoors only.

Al Hemming, Detroit policeman

3) Do you use shooting spectacles and if so what type? Fourteen do not use special shooting spectacles. Of the twenty-one that do, eight use Ray-Ban, four Kalichrome, seven Calobar, and two other makes.

We mentioned early in this article that the group seemed to win most of the laurels from tournament tournament. Such names as Reeves, Benner, Jones, Hemmin Barrier, Starkey, Woody, Densford, et al seem to be old fam iar ones. Just how many years have the coterie been in t game? We divulged the ages, now how about looking into th background? The average number of years of match shooti experience for the group is 12.6 years, and the extreme ran is from three to thirty years. A further breakdown reve the following distribution by years of experience: Five ye or less—two, six to nine years—seven, ten to fourteen years sixteen, fifteen to nineteen years—six, twenty or more ye —four. Please note that twenty-six of the group of thirty-fi or seventy-five percent, have ten years or more match shooti experience and only two, or less than six percent, have fi years or less experience. The eight men comprising the Detr and Los Angeles Police Teams have a total of 113 ye experience or approximately fourteen years each. Even of t two youngest shooters, Brooks at 28 years of age has ten ye experience and Logie at 29 has eight years experience. The seems to be no accelerated aging or mellowing to substitute f the horny hand of experience.

All of the group are classified Masters with .22 and cent fire, and all but five are Masters with the .45. Let's see ho long they struggled before they achieved the top rating.

With the .22 and center fire the average time elapsed the group to achieve the Master rating is 2.7 years, with t extreme ranges from one year or less to twelve years. T frequency distribution by years is as follows: One year less—sixteen, two or three years—twelve, four or five year three, over five years—four.

With the .45 the thirty who are Masters averaged 3.8 ye to achieve the rating, with extremes of one year or less thirteen years. The frequency distribution by years is follows: One year or less—twelve, two or three years—fi four or five years—five, over five years—eight.

Thus forty-five percent of the .22 and center-fire Maste and forty percent of the .45 Masters made the grade in th first year of competition! How many Masters do you kn who succeeded to the classification in their first year of sho ing? It is clearly apparent that the select bunch were p cocious. They quickly mastered the game (at least half them did) and then stayed with it, maturing and hardeni year by year. On the other hand, do not lose hope if y don't make Master your first two or three years. Among t .22 and center-fire Masters, five men worked four to ni years and two bucked it for ten or more years. With t .45, eight of the thirty Masters waited over five years f the classification. Unfortunately I do not have any data comparable figures for Masters in general.

Incidentally, lest anyone questions these figures, please unde stand that the classification system is relatively new and t older shooters obviously had experience before the system w initiated, hence, in most instances, graduating into the Mast ranks almost immediately. Some of the men answered saying immediately or one year after classification syst started, yet these men had been shooting for years previous Perhaps the actual years background is a more accurate ya stick of innate ability. We believe so and offer this explanat to prevent tripping headlong and blindly into a statistical tr

Next we probed into the practice preferences and habits the super shooters. Do they keep a careful record of th practice scores? They do not. Only eight stated they twenty-seven do not. How many rounds per week per cali do they burn in practice? Here there is wide variation. O hardy veteran of twenty years experience, who was among t

Maurice LaLonde, Detroit policeman

first ten in the 1947 and again in the 1948 Nationals, said in no uncertain terms "I never practice at all!" On the other extreme another veteran of many years high standing says he burns 750 rounds a week, 250 rounds with each caliber. When all estimates were averaged it was found that the average number of rounds expended weekly in practice by caliber is as follows: .22 caliber—sixty rounds, center fire—60 rounds, and .45 caliber—forty-five rounds.

Twenty of the group practice all three stages of the National Match Course equally. Among the remainder there is no uniformity. Apparently they place emphasis in practice on their weak stages and concentrate to some extent on them. Only two omitted any stage completely, the timed-fire stage.

We asked each one of the shooters to indicate his practice average and his match average over the National Match Course with each caliber. The purpose of the question was to determine how close to practice scores their match scores are. Twenty-two were able to comply with this request. Here are the figures:

	.22	*Center Fire*	.45
Practice Averages	289.2	285	278.6
Match Averages	287.2	283.4	276.2
Difference	2.0	1.6	2.4

The above figures indicate clearly why these men are on top. They can and do produce the goods under pressure. The figures show that some of the group do even better in matches than in practice. The best practice averages over the National Match Course were returned by Harry Reeves, who reported 294.7, 292.1, and 289.9 for .22, center fire, and .45 respectively (Reeves' match average in Regionals and Nationals in 291.2, 290.8 and 288.3).

The next group of questions to be discussed concerns sights and sighting methods preferences. When asked to give their preference between the conventional black front sight and the red post, twenty-five said they preferred the black. Ten reported that they had no experience with the red post.

The question of aiming point at fifty yards and twenty-five yards was very confusing. At fifty yards fifteen stated that they held at six o'clock, and fourteen used a center hold with all three calibers. The remaining six varied their hold with the different caliber guns, with no degree of uniformity. At twenty-five yards, twenty-four held at six o'clock, and eleven use the center hold. There seems to be a wide variance of preference on this subject and some degree of confusion.

When asked if they make it a practice to change sight settings when changing from fifty yard to twenty-five yard range, fifteen said they did and twenty stated they did not. Those that did not, thought the practice 'only messes you up' or 'adds to your troubles'. Obviously those that do not change sight settings compensate by changing aiming points. When asked whether they change aiming points from one range to the other, half said they did and half said they did not.

Last summer I asked Harry Reeves how he solves his sighting problem. He said "I aim in the middle of the black at fifty yards and wherever I have to at twenty-five yards depending on the gun and load I am using. I do not change sight settings!" This seems to be the simplest solution. On the other side of the fence is Lt. Col. Walter Walsh. I asked him the same question and his answer was "Why do we spend our good money for efficient adjustable sights if we are afraid to use them?" He has a good point. It seems to me that the rifle shooter has enough sense to remember to change his sight setting when changing ranges. Why can't the pistol shooter? In my opinion the method should be based solely on the results obtained, not on the simplicity or foolproof qualities. Only careful trial by the individual will give the answer. My experience has been that the six o'clock hold is so deep-rooted by years of tradition that most pistol shooters still regard any variation from the time honored method extremely radical and will not even experiment with the center hold.

Opinions on ammunition were elicited next on the questionnaire. Ten of the group of thirty-five had no special preferences, four preferred Peters, four preferred Remington, and seventeen liked Western (of these, seven specified Super Match).

As far as loads for .38 and .45 A.C.P. complete study in detail is not possible because complete answers were not received. There seemed to be nothing unusual about the .38 Special loads. Powder charges varied very little from the 2.5 grains of Bullseye standard, and all bullet weights were in the 146- 148-grain range. A few used 2.3 grains for twenty-five yards and three grains for fifty-yard loads.

For the .45 reloads the powder charge varied from 2.8 to four grains of Bullseye. The majority used either 3.3 or 3.5 grains with the 200- or 215-grain bullets. Only five used the maximum of four grains of Bullseye powder.

Quentin Brooks, medical student

The subject of gun preferences and matters of special stocks, sights and gunsmithing was delved into quite comprehensively. We will cover each of the three calibers separately.

First let us survey findings about the .22 caliber. The thirty-five shooters own forty-eight .22's, approximately 1.4 guns per shooter. The average age of the forty-five guns is 5.3 years. Twenty-seven are old type Colt Match Target Woodsman, seven are the new Colt Match Target Woodsman, and fourteen are Hi-Standards.

Of these forty-eight guns, fifteen have factory stocks, fourteen are equipped with Sanderson stocks, twelve with home-made stocks, three with Roper stocks, and four with miscellaneous custom stocks.

Only two of the guns have special barrels (Lamping), and only eight are weighted. The weights average two and a half ounces and are located under the barrel near muzzle. Seven are equipped with trigger shoes and twenty-one with trigger stops.

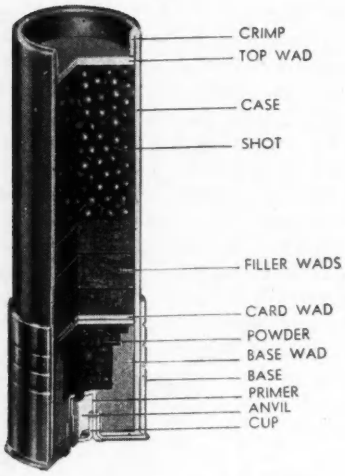
Incomplete information was received on the make and width of sights. Eight shooters stated they used factory sights, eight specified King sights, and seven of the twenty-three that answered the question had Roper sights. As for width, approximately two-thirds preferred one-eighth inch and one-third preferred one-tenth inch. *(Continued on page 46)*

RELOADING SHOTGUN SHELLS

TOO FEW SHOOTERS REALIZE THAT SHOTGUN SHELL RELOADING CAN BE PROFITABLE IN MORE THAN ONE WAY

By Charles L. Neumann

MANY DYED-IN-THE-WOOL riflemen and amateur gunsmiths have developed reloading techniques for shotgun shells and will advise the beginner that there is a wide difference in the skill and work involved in reloading rifle cartridges and shells. Though I am still revising my techniques, I believe that I have encountered most of the stumbling blocks



and devised a method for reloading that will work for anyone interested in making a science as well as hobby out of his shooting.

The first question will naturally be: "Can I reload my shotgun shells more cheaply than I can buy them?" The answer is a definite yes. Let me explain.

According to prices in the current RIFLEMAN, shot sells at $8.50 per 25 pounds, ⅜-inch wads at $3.50 per 1000, .135-inch wads at $1.50 per 1000, Type B (over-powder) wads at $1.25 per 1000, Red Dot powder at $1.10 per half pound, and Winchester primers at $5.50 per 1000. Using 28 grains of Red Dot per shell, you can load approximately 250 shells for a 12 gauge with a pound of powder. Using 1¼ ounces of shot, twenty-five pounds of shot will load 320 shells for 12 gauge.

Breaking down these figures to one box lots we find that 1¼ oz. 3¾ dram equivalent loading for 12 gauge will cost approximately $1.25 per 25-shell box. The 1⅛ oz. 3¼-dram equivalent loading for the same gun will run around $1.17 per box. These prices will vary as do the costs of the components but they should be close estimates.

In reloading shotgun shells you encounter several kinds of cases, primers, shot and powder. As a word of warning, don't try to load mixed cases. In any one brand alone you will find different chamber lengths, so choose one brand, one type case in the brand, and make up a shell for a pattern; then use the same brand, size and type, until you becom accustomed to the job.

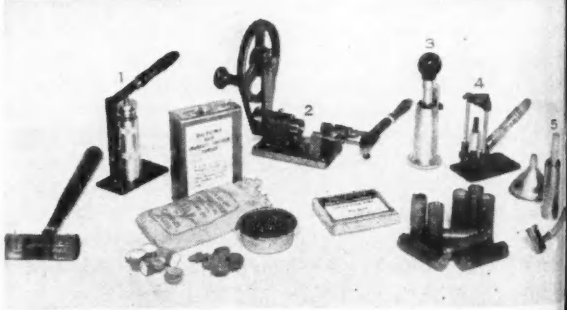
Western, Winchester and Federal shells use the same si primers. Also, the chamber lengths of these three shells not vary to any appreciable degree, which would affect t reloading. Too, the Western primer is a little easier to fi than Remington, however the Remington shell with its sm corrugated sides makes a better shell for reloading. The o thing to be concerned with, then, is the accumulation of ca and primers to fit your specific job.

I have found that I can make up a load to fit any one Western, Winchester or Federal cases and the load will wo in the other two brands of cases. However, a load for Remington case will require more experimenting, in w sizes especially, than the other three.

Before attempting to reload, one must necessarily have th proper tools, as follows: Powder measure, scales, resizing di mallet, decapping tool, recapping tool, loading sleeve, s measure and crimping tool. Some of the tools are pictur on this page, and drawings and dimensions for a resizing di a loading sleeve, a decapping tool, a powder measure and recapping tool are given on page 21.

After accumulating the proper number of cases, prime shot, and wads, the first step is to resize the cases since th are expanded by firing. The resizing die is merely a holl cylinder bored to the proper dimensions for the gauge desir The die is placed in a vise horizontally and the shell c forced in from right to left by tapping with a block a mallet until the case rim stops further entrance into the d At this point the case is full-length resized, or back to original size.

The next step is to decap the case. This is done by placi the decapping tool into the shell while still in the die a tapping with a mallet until the primer falls out. Furth tapping will remove the case from the die. It is best resize and decap all your cases before starting the ne operation.



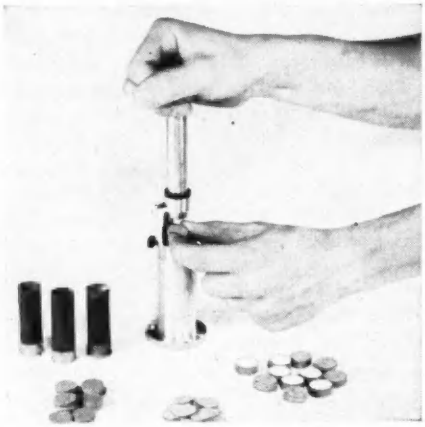
Pictured are tools and components used in reloading shotgun shells. Id tified by number are tools used in putting both new (1) and old (2) s crimp on finished shell, the loading sleeve (3), the re- and decapper (4), the resizing die (5). Wads, shot, and measure can be recognized e

First step in reloading shotgun shell is to resize case by driving it into die with rubber mallet

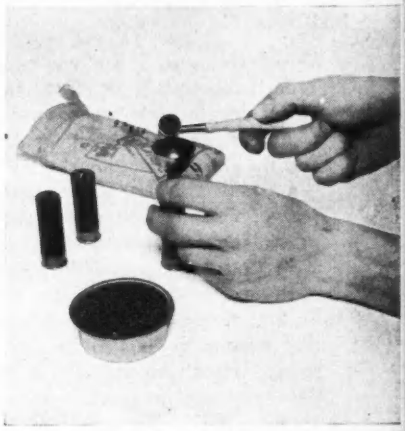
Next, case is inserted in re- and decapping tool and fired primer is forced out of primer pocket

After decapping, new primer is inserted in case and seated gently by lever

Though dipper can be used, it is wiser to use powder measure and scales in measuring powder



Wads are placed over powder. Practice may be required before proper pressure can be applied



Shot is measured and poured into cases over wads. Next, case must be crimped

You are now ready to prime the cases. Priming shot shells is a simple operation requiring little pressure. It is unlike priming a rifle case, which requires considerable pressure to press the primer into the cup. If a primer does not press into the pocket easily, don't try to force it or you might cause it to explode. The shell is placed in the holder of the recapping tool, the primer placed on top of the pocket and the lever pressed down until the primer is seated. Prime all cases and set up for reloading.

Both powder measure and powder scales are used in the reloading operation. I wouldn't recommend using a dipper except for black powder, because most shotgun powders are flake type. Unless you are an expert at dipping powder, the charge will vary greatly with the 'jiggling' of the dipper, resulting in uneven charges in shells that should be exactly the same and increasing the danger of overcharged cases. The mechanical powder measure is by far better to use, even for experts.

First determine the correct load for the shell and measure it on your scales. Next, the powder measure is set to discharge a corresponding load. Fill the hopper full of powder and practice operation of the measure until you have developed a consistent method which gives you an equal weight of powder at each stroke. Careless or uneven use of the measure will vary the charge by two or three grains, which can be dangerous. This is especially true of the type of measures that employ a small hammer or knocker to load the powder into the measuring chamber. Once you have mastered the measure and your charges are even, you can dispense with the scales except for spot checks.

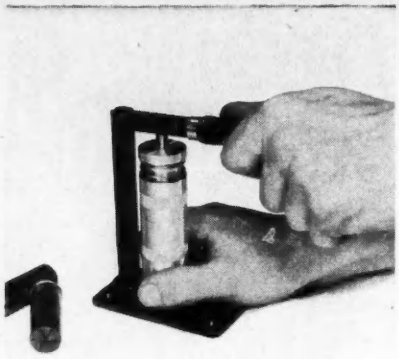
When your charges are even, begin dumping them into the empty cases, placing over-powder wads on top. This is a safety measure which will keep you from placing double charges in any one shell. When all the cases are charged with powder, the filler wads are pushed in. It might be wise to explain the necessity for these filler wads.

The first shotguns were developed to use black powder and the length of shells was established by necessity. A typical charge was 3¼ drams of black powder, which occupied a specific volume of space. An over-powder wad was placed over the charge, a small wad added, the shot poured in and the case was crimped. It would not be practical to redesign guns to use shorter shells, so the same length case is still in use. Since a charge of smokeless powder occupies less space than an equally strong charge of black powder does, it is necessary to fill the vacant space in the case with wads of paper or felt back of the shot.

If you are the owner of a Damascus barrelled gun and wish to load with black powder, you need only narrow wads—enough to fill the case. Also, owners of prewar Browning automatics can load full charges in the shorter cases by varying wad sizes since modification of the chambers would be required if longer shells were used in them.

It is more practical, I find, to buy the thickest wads available and slice them down to the proper thickness than to fill the case with thin wads. To give an example, in loading a

After top wad is placed over shot, crimp must be started by pressing edge of case mouth down



New type crimp (see case) is easier to put on shell than old type requiring case trimming

Old style crimp is put on by placing case in tool and applying an ever-increasing pressu

Winchester case I can use one over-powder wad and two ⅜-inch filler wads on all 12-gauge loads and still have the proper length shell when finished. Should a ⅝-inch filler wad be necessary, ⅛ inch could be sliced off one ⅜-inch wad and the job is done quickly.

I prefer the paper-type filler wads rather than the felt type because the felt wads, unless greased, cause high pressures. Paper wads, made of material similar to Celotex, are easy to handle and do not increase pressures.

In pressing the wads down, the shell must be placed in the loading sleeve to prevent any expansion of the case when the pressure is applied to the wad. Each wad must be pressed down into the case individually because each powder requires a certain pressure of the wads on top of it. For example, using Hercules Red Dot in a 12-gauge shell, 78 pounds of pressure on the over-powder wad is recommended. A little practice pressing down with your loading plunger (merely the decapping tool turned upside down) on a bathroom scales will allow you to judge the proper pressure to use for your chosen powder.

The wad pressures used for reloading shotgun shells are:

Gauge	Hercules Infallible	Red Dot	Hercules Herco	Dupont Oval
12	25	78	78	78
16	25	62	62	63
20	25	62	62	55
410	25	64	64	25

In placing the over-powder and filler wads into the case, they must be started in vertically, then turned horizontally and pressed down. Keep the same pressure on each wad as it is pushed down into position.

Loading the shot is simple. Merely set the scoop to the required number of ounces and pour a few pounds of shot into a container. Run the scoop through the shot, bringing it up full and level, and dump it into the case. In the event the case is too full, and you haven't enough case left for crimping, you will have to decrease the thickness of the filler wads. The reverse is true if you have too much case left. A little practice will eliminate these errors. Don't try loading different sizes of shot in the same operation.

To start the crimp before placing the case in the crimping tool, I pinch the end of the case with my thumb and first finger until it looks like a six-pointed star in the center. If you don't use an over-shot wad you must press the crimp all the way into the center, closing the hole to keep the shot from falling out. Place the shell into the crimping tool, apply pressure and turn the crank. Apply a small amount of pressure at first while turning, then increase the pressure unt you are satisfied that the shell is crimped over. Some practi will be required to do the job satisfactorily, so don't becom discouraged if the first ones look a bit sloppy. I personall always use an over-shot wad because it is easier and sometime the crimping doesn't altogether cover the face of the she Too much pressure will distort the shot and swell the ca so they won't chamber in the gun. Too little pressure wi make a ragged crimp.

After all shells are crimped, heat a pan of paraffin h enough to bubble when a brush is dipped into it. With th brush, paint the ends of the shells to seal out any moistu which will ruin your shells. Caution: Do not dip the en of the shells into the paraffin because so doing will increase th size of the end of the shell and also will make them sti in the chamber.

It is very important that you develop a system of loadin Perform each operation on all shells before starting the ne operation, and keep different size shot shells separated labeled boxes. You might use a rubber stamp or some meth of labeling individual shells.

Now a description of the tools and instructions on how make most of them. According to the most recent reloadi handbooks, both Lyman Gun Sight Corp. and Belding a Mull had shot shell reloading tools available. Both handboo also contain helpful information on reloading shot shells.

The resizing die should be made of steel, reamed and po ished to the proper diameter. Dimensions of dies for vario calibers are given with a drawing on page 21.

The loading sleeve (cylinder) is about .001-inch larger i diameter than the factory dimensions on the shell, which necessary so that the shell may be pushed in and out easily wi the fingers. Seamless aircraft tubing of the proper size is ide for the sleeve, and most any airplane junkyard has all kinds seamless tubing. The thickness of the wall is not too im portant, as in the resizing die, for no great pressures are exert on the wall. The sleeve is the tube used in pressing the wa down over the powder, and if you want to speed up the oper tion make several of them from the seamless tubing. A dra ing of the sleeve with dimensions for various gauges of she is given on the next page.

The decapper punch and wad plunger tool can be made any hardwood: oak, maple or rosewood. The drawing gives idea of what it looks like and the table gives the exact dim sions necessary for various sizes of guns. It is possible th you can find dowel stock and save yourself a little work. T

pin must be made of steel, sticking out of the main portion of the tool about ½ inch for all gauges of shells.

The shot scoop can be made from a piece of tubing by fastening a bottom to the tubing section and attaching a handle. A drawing of a typical scoop is shown with dimensions for sizes of measure.

A recapping tool can be made out of ¼-inch flat iron 1½ inches wide. A sketch with dimensions of the tool is given.

Unless you own a machine shop, I wouldn't advise trying to make a crimping tool. If you buy one, be sure to get one that puts the new type crimp in the shell because the largest percentage of shells on the market today have the new crimp. The old style tool is hard to use and necessitates the purchase of a shell trimmer for use in the resizing operation. Over-shot wads would also be needed. I use them anyway, but they are not always necessary in new-type shells. In buying, get a heavy duty crimper, since the light cast iron type will break under heavy pressure. For those who insist on making a crimper, some ideas may be obtained from various catalogs.

The powder measure I recommend is the Belding and Mull. No attempt will be made to describe how to make one, nor would I recommend cutting open any shotgun shells and duplicating the powder charges. When a factory loads ammunition, they manufacture a lot of powder. The lot is then tested for pressure and velocity and the ammunition is loaded accordingly. As an example, I cut open some Remington Shur-Shot shells and weighed the charge of powder. The shells were plainly marked Red Dot. I found the charge to be 31 grains of Red Dot, for a 3¼ dram equivalent loading, whereas I would never recommend over 28 grains of canister lots of Red Dot. I find that the canister lots are more uniform. From the post mortems performed on the primers after firing a 28-grain charge, I think 28 grains is a maximum load.

Below are some tables of recommended charges which I have used. Since most 10-gauge guns are old I have no charts for 10-gauge shells and would recommend nothing but black powder loads. Also I want to again caution any owner of a Damascus barrel gun to stick to black powder.

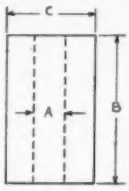
Gauge	Shot Charge	Red Dot	DuPont Oval	Hercules Herco	Hercules Infallible	DuPont M x
410	⅝	7.0	9.4	10.0	7.0	
20	⅞	18			18	18
16	⅞	20			20	21.5
16	1		34	37		
16	1⅛			32		
12	1	24			24	25
12	1⅛	26			26	
12	1¼	28			28	
12	1¼	30			30	
		BlackPowder				
10	1¼	3½ Drams				
		BlackPowder				
10	1⅜	4¼ Drams				

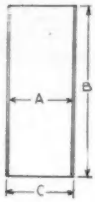
In loading shot shell ammunition, you can develop a load for your particular gun. While one brand of shell patterns satisfactorily in one gun, it may not in another gun of the same type. In developing a load for your gun, load a few shells, then pattern them under equal conditions. If the loads are not satisfactory, try a different powder or increase or decrease the shot charge until you get what you want. Usually it is not practical to reload shells after you have reloaded them once, for the new-type crimp tends to fray after being shot the second time. If, however, they appear to be as good as the first time shot, I see no reason for not using them again. ◆◆◆

DIMENSIONS FOR TOOLS

RESIZING DIE

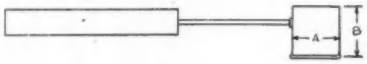
Gauge	A	B	C
12	.800	2¾	2
16	.735	2¾	2
20	.687	2¾	1¾
410	.468	3½	1





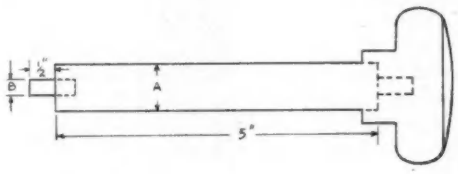
DECAPPER PUNCH

Gauge	A	B
12	.675	.220
16	.650	.220
20	.605	.220
410	.335	.220



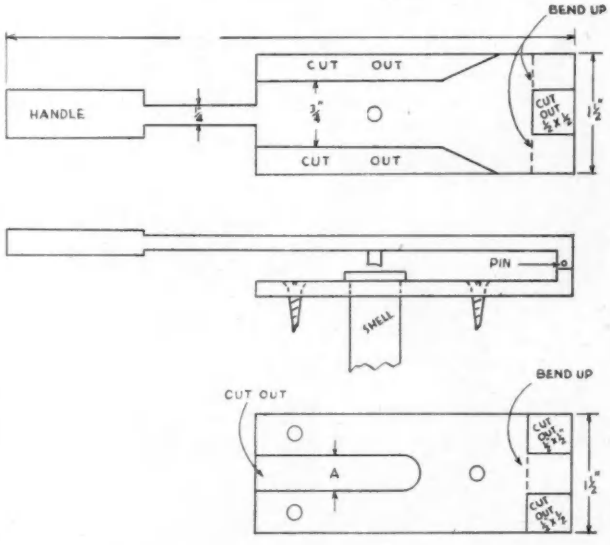
SHOT SCOOP

Ounces	1¼	1⅛	1	⅞	¾	⅝	½
A	11/16	11/16	11/16	11/16	11/16	11/16	11/16
B	⅞	13/16	¾	⅝	9/16	½	⅜



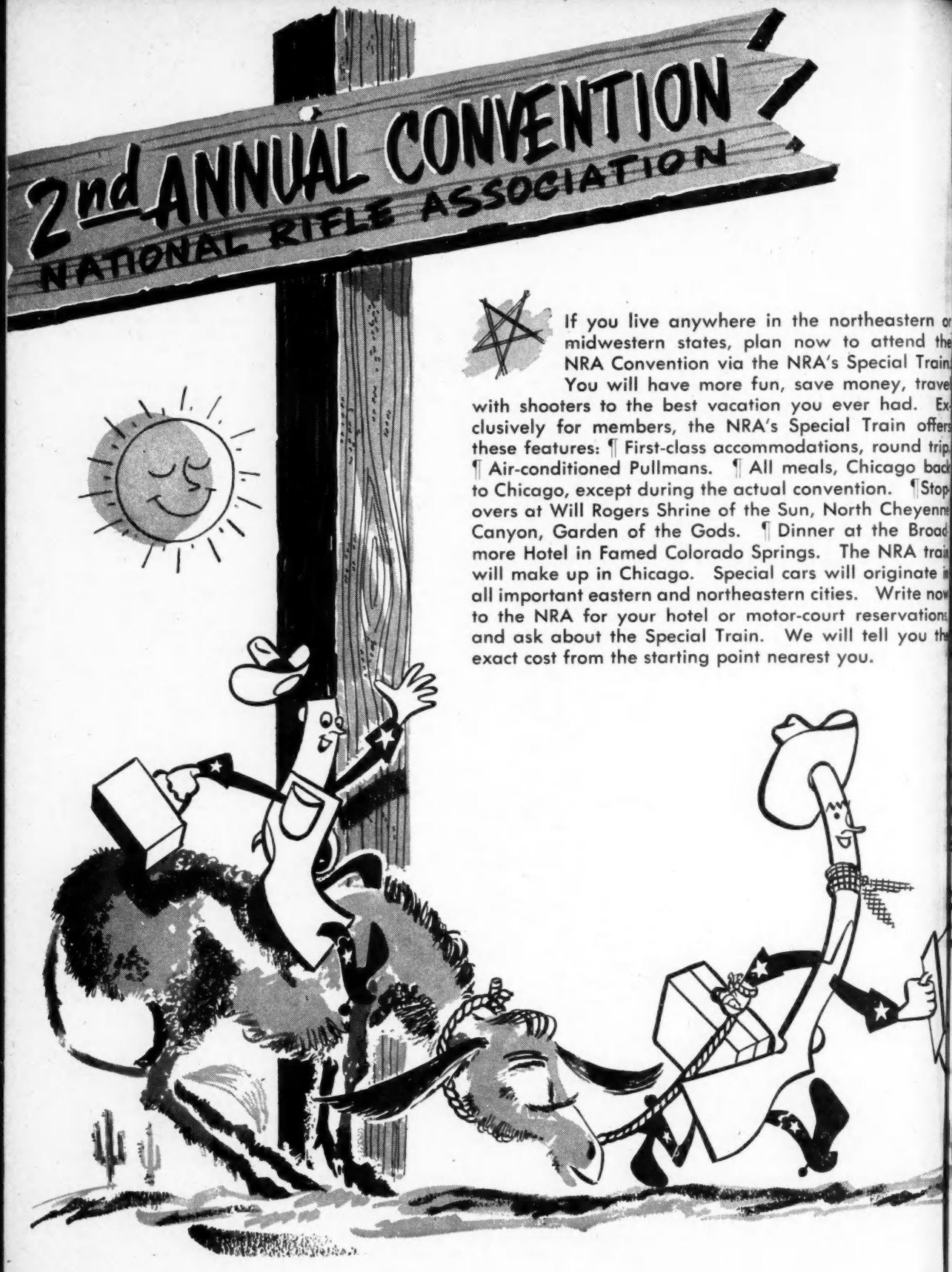
LOADING SLEEVE

Gauge	A	B	C
12	.802	2⅜	.822
16	.737	2¼	.757
20	.689	2¼	.709
470	.470	2¾	.490



RECAPPING TOOL

Gauge	A
12	.805
16	.737
20	.690
12	.472



If you live anywhere in the northeastern or midwestern states, plan now to attend the NRA Convention via the NRA's Special Train. You will have more fun, save money, travel with shooters to the best vacation you ever had. Exclusively for members, the NRA's Special Train offers these features: ¶ First-class accommodations, round trip. ¶ Air-conditioned Pullmans. ¶ All meals, Chicago back to Chicago, except during the actual convention. ¶ Stop-overs at Will Rogers Shrine of the Sun, North Cheyenne Canyon, Garden of the Gods. ¶ Dinner at the Broadmore Hotel in Famed Colorado Springs. The NRA train will make up in Chicago. Special cars will originate in all important eastern and northeastern cities. Write now to the NRA for your hotel or motor-court reservations and ask about the Special Train. We will tell you the exact cost from the starting point nearest you.

LIST OF EVENTS

To convince Doubting Thomases (if there are any left) that the NRA's Second Annual Convention is a not-to-be-missed occasion, here are the details of the October 17-21 program. If you attended the first annual get-together in Washington, you'll need no convincing. If not, read on, brother shooter!

Monday, October 17: Following the opening session, at which officers and hosts will be introduced and the NRA organization described, there will be a 'get-acquainted' luncheon for both men and women . . . to enjoy a leisurely buffet and give you a chance to meet your Denver hosts and fellow convention visitors. In the afternoon . . . a general session on that all-important shooter's topic, firearms legislation, followed by an open panel on the same subject . . . for the ladies, a tour of mile-high Denver . . . for you, an open small-bore discussion meeting . . . and the opening of 'Commercial Row', where you'll meet the manufacturers and distributors of the many products advertised each month in the RIFLEMAN.

Tuesday, October 18: A convention general session slanted toward the development of better local club organizations . . . followed by panels set up for the discussion of junior and senior club problems . . . and at noon, the Trailblazer Luncheon, first annual get-together for the NRA's 'Blue Pin' members —the seven-hundred-odd who attended the NRA's first convention in Washington last year. In the afternoon, a general session hinging on the NRA competitive program, followed by an open meeting for the pistoleers, presided over by committee chairman Smitty Brown.

Wednesday, October 19: Highlight of this third convention day is the annual NRA member's meeting, at which officers' reports will be heard and election of directors will be held. In the afternoon . . . the .30-caliber committee meeting . . . a fashion show for the fair sex (and any male courageous enough to show up) . . . and, by now a regular feature, special demonstrations as evening features of the lively exhibit section.

Thursday, October 20: If you're an 'official referee', up early for the annual breakfast meeting . . . for the wives, a motor trip to Colorado's famed and breathtaking mountain parks, with a luncheon stop high in the peaks . . . open afternoon sessions of the pistol, small-bore, and .30-caliber committees, at which recommendations for the NRA's executive committee will be put into final form . . , and for early evening, an outdoor barbecue in true Western style.

Friday, October 21: 'Heaviest' day of the convention leads off with the annual meeting of the board of directors of the NRA . . . an open session at which convention delegates can hear their suggestions and recommendations acted upon by the governing body of American shooting. At noon, the director's luncheon . . . two o'clock, meeting of the executive committee . . . in the afternoon too, side trips in and around Denver . . . at seven-thirty, the directors' reception . . . and winding up the big show, the annual members' banquet and dance.

Want to miss a show like that? Of course you don't. Then get those reservations in and plan to be on hand when the NRA's Second Annual Convention gets underway. As a representative of the American shooting game, you will be helping to govern your own sport in the democratic American way . . . the way America, and American sports, must always be governed!

PLAN NOW TO ATTEND!

SHIRLEY-SAVOY HOTEL
DENVER, COLORADO
OCTOBER 17-21

WRITE FOR RESERVATION FORM
TO NATIONAL RIFLE ASSOCIATION
1600 RHODE ISLAND N.W. WASH. 6, D.C.

ACCORDING TO ELMER KEITH, THE LITTLE COYOTE IS NORTH AMERICA'S WILIEST GAME ANIMAL. WHEN YOU'VE LEARNED TO OUTWIT HIM CONSISTENTLY, YOU'RE A REAL RIFLEMAN!

UNCLE SAM'S YELLOW DOG

BY STAN DE TREVILLE

Photographs by the Auth

NO LESS AN AUTHORITY than Elmer Keith once wrote, "Of all our American game, large and small, I know of no animal that is so difficult to hunt successfully as the coyote." Keith places the little coyote above sheep, goats, caribou, mule and white-tailed deer, elk, and black and grizzly bear. He continues: "I get more real satisfaction and sport from successfully outwitting Uncle Sam's yellow dog than in the taking of any of the species of big game."

Of course Keith was referring to the hunting of coyotes on foot and not from a car as they are generally hunted in Southern California. However, an animal as intelligent and quick to learn as the wily coyote soon becomes as wary of a car as of a man, and they have the added advantage of being able to hear, sight, and scent a car at considerably greater distances. I have seen a coyote more than four hundred yards away turn a back somersault in its haste to get away from an approaching vehicle. On the other hand, where they are not hunted continuously in this manner they are as blasé about automobiles as any city-bred pup, and often stand beside the highway nonchalantly watching the cars whizz by.

Much of the coyote country in Southern California is composed of large areas of rolling grazing land adjacent to brush-covered hills and mountains. Narrow private roads, used in harvesting grain or caring for stock, provide the coyote hunter with the only practical means of patroling this sprawling territory. Scattered farms and ranches furnish the coyote with a diversified diet, for he is not in the least choosey about what he eats. Poultry, corn, grapes, watermelons, pigs, calves, sheep, manzanita berries, small game, deer, and even carrion garbage, are all devoured with apparent relish.

Under such ideal living conditions these clever fur poachers have flourished to such an extent that many wat melon growers and turkey ranchers have had to resort to bu ing lights at night to keep from being raided. Little pigs the score have disappeared down the hungry gullet of *Ca latrans*. In one area near the Marine Corps' Camp Pendlet the coyotes' meat bill came to over $20,000 worth of mutt In view of such depredations most of the ranchers willing permit hunting on their grounds—providing you can show are getting results and are not endangering stock or ran property.

The usual hunting procedure employed is to drive along old roads, scanning the countryside for a glimpse of one these pint-sized wolves. When sighted they are usually high gear and show little inclination to make your acquai ance. Luckily though, a sharp whistle usually has the sa effect on coyotes that it has on most gals, and they'll stop look back. From then on you have to work fast. You h about seven seconds to get out of the car, estimate your ran get into some sort of shooting position, and squeeze trigger.

Most of the shots are at 200 yards or beyond, and a coy at that distance looks smaller than a dab of restaurant butt The fellow who attempts this type of hunting with iron sig is at a distinct disadvantage. On the other hand high-po target-type scope sights, although used by some hunters here, have too small a field and require too much time to loc the game. A scope of from four to six power is ideal.

The type of gun used on Southern California coyotes var with the preference of the individual. My hunting partn George Hall, uses either a .30-'06 or a .30-40 Krag equip with a Winchester 5A scope. At the other extreme, P Dinant, a veteran target shot and coyote hunter of more th 25 years experience, prefers the wildcat .25-'06 with a mediu heavy barrel, double-set triggers, and a twelve-power Feck My own outfit at the present time consists of a .30-'06 mo 70 Winchester with a K-4 Weaver scope. In addition I having West Coast gunsmith Lindsey King build a .300 H& Magnum with a 26-inch Pfeifer barrel and a K-6 Weaver the really long shots.

Although I use the .30-'06 and consider it adequate up about 300 yards, it is not the ideal coyote weapon. A flat shooting rifle such as the .270 with the 130-grain bullet, .300 H&H with the 180-grain bullet, or some of the .25-cal wildcats are much better suited for this type of hunting are effective to about 100 yards beyond the range of the .30-

California coyotes are not large. Paul Dinant has b keeping an accurate record of the weights of animals shot o a period of time and has found the average male weighs ab

Shooting at a coyote through brush like this is no job for one of the ultra high-speed .22-caliber rifles. The author prefers the .30-'06 or .300 Magnum

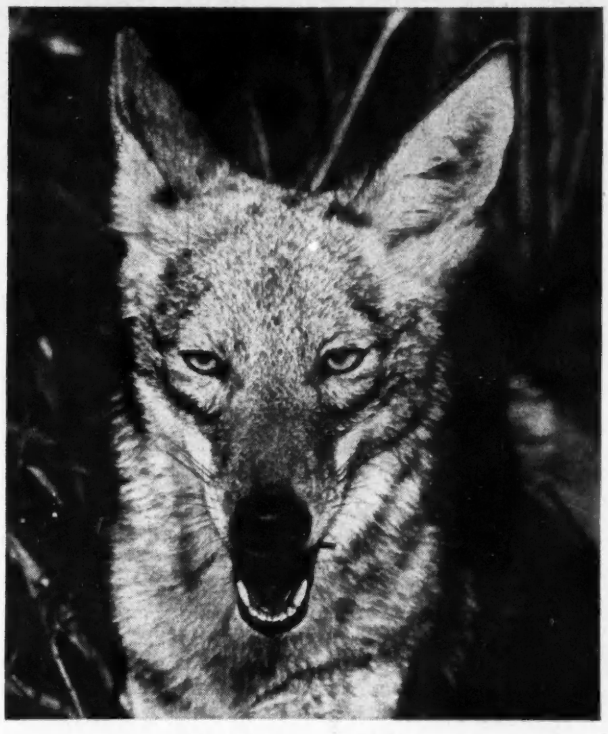
29 pounds, with the females about six pounds lighter. The heaviest male he has taken so far weighed 36 pounds and the heaviest female tipped the scales at 27 pounds. Not a very big animal to have to use an '06 or a .300 Magnum on, but don't let their size fool you; they require a lot of killing.

During the past several years Dinant has used the .220 Swift, the .220 Arrow, the 2R Lovell, and the .22 Varminter on coyotes, and has discarded them all as lacking the necessary killing power for this work. On one occasion he shot a coyote through the center of the chest at only 65 yards with the .220 Swift, only to have it regain its feet and run off into the brush where he was unable to find it. This was with the 55-grain Sisk bullet traveling at a muzzle velocity of 3,750 feet per second. Another coyote, shot at 90 yards with the 2R Lovell, did the same thing. Contrary to general opinion these light, ultra-speed bullets seem to kill better at the medium distances than at close range. The reason is that when traveling at their terrific initial speed the bullets blow up on the surface of an animal as muscular as a coyote, instead of penetrating into the vital parts; and if a heavier jacketed bullet is used it fails to expand properly at the longer ranges. Another disadvantage with the light, ultra high-speed bullets is that they are too often deflected by brush or grass and are also quite prone to be wind sensitive.

I generally use .30-'06 172-grain boattail service ammunition with the points of the bullets filed off and a 1/16-inch hole 3/16-inch deep drilled in the tip. This has proven to be an excellent killing load but usually leaves about a two-inch exit hole, damaging the pelt quite badly. (In Southern California the fur is usually poor for about ten months out of the year so this isn't a major consideration with us.)

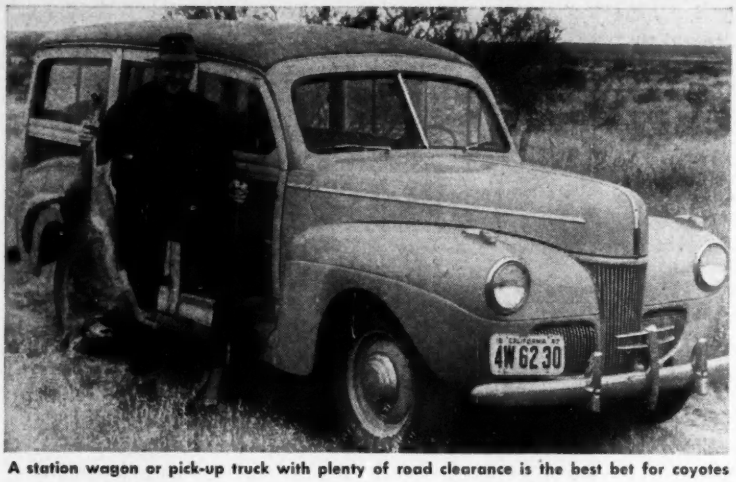
Even when hit with a .30-'06 a coyote is apt to keep right on going. It is always wise to investigate even though you think your shot was a miss. This was brought home clearly on one of my hunts with George Hall. We had just rounded a little bend in the road when we caught a glimpse of a large coyote running at top speed up the opposite hillside. Slamming on the brakes we piled out of the car, whistling like two peanut vendors as we did so. The coyote ran for a short distance but finally stopped behind a sumac bush, where he peered down at us from about 200 yards distance. Apparently he thought he was hidden from our view, and in fact was, from where Hall was standing. I could just make out a portion of the coyote's shoulder through my scope sight, so decided to risk a shot. As the gun went off the recoil kicked it up so that I temporarily lost sight of the animal and could not tell where my bullet had struck. A second later we saw the coyote run around the slope and vanish over the crest of the hill. Our first impression was that my shot had missed completely, and we were about to go on; but upon talking it over we recalled that the coyote was wringing its tail like a windmill while it ran. This is usually a sure sign that a coyote is hard hit, so I climbed the brush-covered slope and managed to locate the spot where the coyote was standing when first shot at. It didn't require J. Edgar Hoover to tell that the coyote had been hit, for there was a funnel-shaped spray of crimson covering the grass for a distance of three feet. The bright red color of it indicated a lung shot so I knew he couldn't be far away. Even with this mortal wound the coyote had run around the edge of the hill for a distance of seventy yards before collapsing in a bush, deader than the proverbial mackerel.

On another occasion Hall, Cy Shepperd and I surprised a coyote in rather open but hilly country. The coyote instantly ducked around the side of the hill. Dropping Hall off in case the coyote should double back, we stepped on the throttle and raced to the top. Sure enough the coyote was about a hundred yards down the slope and looking a bit sheepish for having been caught out in the open. Shepperd was out of the car before it stopped and fired just as the coyote leaped from sight over a little knoll. It was a fast snap shot without time to aim, for a frightened coyote is as elusive as a galloping ghost. We both figured the shot had missed, but when the animal failed to



The coyote is increasing in numbers over much of his range. Well able to take care of himself, he will be a prime target for many years to come

Paul Dinant, veteran coyote hunter, weighing in a 24-pound female. Average weight of Southern California male coyotes is a little under 30 pounds



A station wagon or pick-up truck with plenty of road clearance is the best bet for coyotes

reappear farther down the hillside Cy finally went to investigate and found the coyote had been almost decapitated by a shot through the neck from his .270.

Incidentally, if you are not sure of your whistling ability it is wise to take a manufactured one along, either of the type used in training dogs or the ordinary toy variety. There's nothing quite so exasperating as to see a coyote go loping off across the hills without a backward glance and find that your lips, tongue, and teeth just won't emit anything louder than a very soft "sssssssssppfftt."

Another requirement for successful coyote hunting is the ability to estimate distances accurately. This is much harder than it would seem, for varying types of terrain have the disconcerting habit of producing optical illusions that fool even the most experienced hunters. Like most people, I have a tendency to overestimate ranges and there is no sure cure for this fault. However, guessing at the distance of various objects and then actually pacing it off is excellent practice and will perceptibly improve your range estimating. George Hall is constantly doing this in spite of all his years of experience (he was Champion All-'Round Shot at Camp Perry in 1919), and it reflects in his ability to judge distances. Even with his allegedly poor eyesight, unsteady hands, buck fever, and other ailments he complains of, I have seen him hit a coyote twice at 400 yards, one of the shots while the animal was running—and brother, that is *real* shooting.

A further aid to range estimating is the use of a telescope sight equipped with a dot or post reticule of a known size. My K-4 Weaver has a tapered post with cross hair which I use for this purpose. The post subtends five minutes of angle above the cross hair, or in other words covers five inches at 100 yards, ten inches at 200 yards, and so forth. As a coyote's chest is approximately ten inches deep the portion of the post above the cross hair will cover half of it at 100 yards, all of it at 200 yards, extend about ⅓ above at 300 yards, and ½ above its back at 400 yards. Beyond that distance I figure I'll miss a coyote anyway so don't bother to shoot.

A thorough knowledge of the ballastics of the rifle and ammunition you're using will also help in co trolling the coyote population. A rifle that sighted for too short a range will fail to carry sufficiently for hits at greater distances. It is ways wise to sight your rifle for its maximu effective range. For example I have my .30- sighted for 250 yards. This places the bull about 2½ inches high at 50 yards, 4 inches hi at 100 yards, 3 inches high at 200 yards, on t button at 250 yards, and 5½ inches low at 3 yards. With the rifle sighted in this manner y hold for the bottom chest line up to 200 yar aim where you wish to hit at 250, and hold the top of his back at 300 yards. On the oth hand, if the rifle were sighted in for only 1 yards, the bullet would have dropped 16½ inch out at 300 yards, or enough to miss a coyo completely.

One of the longest shots I have made on coyote is also one of which I am least proud, and one that h been the source of much good-natured ribbing from Pop Ha We were driving along on a dull overcast morning when spotted a coyote standing in a distant stubble-field. He w crouched low with his head down and had a dark object his feet that I took to be a rabbit. He was a long way off a even through my scope I was not sure that it actually was coyote until it moved its head. Then I went into acti Laying the rifle across the hood of the car I took careful a and squeezed the trigger. The results were instantaneo although somewhat surprising. A puff of dust kicked up j beyond the coyote and it appeared to be a miss. Neverth less, at the crack of the rifle the coyote gave a mighty lun turned a complete somersault and lay still. Hall started say that I had overshot but instead stared unbelievingly at t inert form of the animal. I decided that the bullet must ha passed right through the animal and then kicked up the du so I made some flippant remark about never missing. But spoke too soon. About this time the coyote ra ed its head a looked groggily around, finally regaining its feet. Again fired and this time it went down with a patch of crimson its neck. He was up again almost at once and to my utt chagrin and embarrassment I discovered it had a trap dangli on one of its front legs. It was all too clear now. My fi shot *had* been a miss and the coyote had just been thrown f when it had reached the end of the anchored trap chain. Th the next shot had been a hit but at the long range the bull had gone right through the neck without mushrooming. N wishing to let the animal suffer any longer I finished it wi a third shot, this time hitting it in the shoulder. We la paced the distance and found it to be a good 365 yards. Ev so, it was a hollow achievement, and I gained small satisfa tion from the knowledge that I had scored two hits out three at that distance. Especially when Pop Hall subt pointed out that if I could just make the proper arrangeme with enough local trappers I could probably make quit name for myself as a long-range coyote shot. (Secretly, I seeing what can be done about the matter.)

CHANGE OF ADDRESS: *Please report changes of address direct to the National Rifle Association, allowing five weeks before change is to take effect. Be sure to send your old address, preferably address label from the* RIFLEMAN, *together with new address. Copies that have been mailed to an old address will not be forwarded by the Post Office unless extra postage is sent to that office by the subscriber. Avoid such expense, and make sure of getting your* RIFLEMAN *promptly each month by notifying the NRA direct, in advance of change. Address the National Rifle Association, 1600 Rhode Island Avenue, Washington 6, D. C.*

LEGISLATIVE Bulletin

A MONTHLY ROUND-UP OF CURRENT LEGISLATION

SINCE LAST MONTH'S report on pending firearms legislation, five more state legislatures have adjourned. Several more unwise and restrictive bills have been defeated by the timely action of NRA members and cooperating sportsmen's groups. Out of the battle several important things have become apparent. One is that the law-abiding sportsman, when he speaks his mind, has no difficulty in finding sympathetic listeners among his elected state legislators. Another is that many more bad firearms bills are introduced through ignorance of the shooters' viewpoint than through any desire on the part of legislators to curb legitimate rifle and pistol shooting. Both of these things point to the urgent necessity of continuing and expanding our program of common-sense firearms education. Education is needed to teach shooters the importance of being aware of legislative trends in their state—aware, for example, of the importance of game-law enforcement to the entire picture of firearms control. To teach children and parents the importance of basic marksmanship knowledge as a safeguard against gun accidents. To teach communities that vandalism by youngsters with guns and air rifles is unknown in those places where Junior Rifle Clubs provide proper gun instruction for boys and girls. And, perhaps most important of all, to teach legislators that good sportsmen are aware of the problems presented by game-law violations, gun accidents and vandalism, and that they have accepted a responsibility to do something about them in a more effective way than by antigun laws.

In those states where the legislature has adjourned since the previous report, it is assumed that pending legislation died with the legislature unless otherwise noted here.

Alabama—House Bill No. 239, by Representative George E. Stone, would make mandatory a six to twelve month sentence at hard labor for violators of certain sections of the existing pistol law. Also provides that all seized pistols be destroyed by Sheriff after conviction. *Action:* None.

Senate Bill No. 41, by Senator Henry H. Mize, provides for confiscation and legal disposition of pistols illegally possessed or carried, after convictions in court. *Action:* None.

California—Assembly Bill 210, reported in March, would prohibit possession of a loaded gun in a vehicle. *Action:* None.

Assembly Bill 1690, reported in April, would prohibit discharge of a firearm in urban areas. *Action:* None.

Delaware—Legislature adjourned June 5.

House Bill 280, reported in April, would prohibit possession of a loaded firearm in a vehicle or on a farm machine. *Action:* Passed House and Senate sent to Governor.

Illinois—House Bill No. 712, by Representatives James W. Gray and Charles M. Skyles, reported in June, would give Illinois a restrictive form of "Uniform Pistol Act." *Action:* Sub-Committee agreed to withdraw Mr. Gray's Bill and substitute NRA-suggested "Uniform Firearms Act."

Massachusetts—Senate Bill 97, reported in June, would prohibit possession of firearms other than .22, in any place where deer might be found. *Action:* Replaced by substitute Bill No. 2392 from which all features objectionable to sportsmen have been withdrawn.

Michigan—House Bill No. 53, reported in March, would increase the fee for a license to sell, purchase, possess or carry firearms. *Action:* Passed in House, now in Senate.

House Bill No. 159, reported in April, would prohibit use of .22 caliber rifle in any area frequented by deer. *Action:* Passed in House but objectionable part of bill was removed by amendment.

Senate Bill No. 99, by Senators James Milliken and Frank Heath, is the Senate version of original House Bill 149 (see above). Senate Bill No. 99 would prohibit the possession, in any area frequented by wild animals or wild birds, of any automatic, semi-automatic or autoloading shotgun or rifle larger than .22 rim fire, capable of holding more than 6 shells. *Action:* Now in House-Senate conference.

"I insisted we go to the mountains so we could hunt and my wife wanted the seashore . . . so we compromised."

Ohio—House Bill No. 11, reported in March. *Action:* Passed in House February 21st. Now in Senate.

Wisconsin—Senate Bill No. 474 would revise Wisconsin criminal procedure. The objectionable change in the new wording, pointed out in the NRA Legislative Bulletin of April 15th, will be corrected by amendment to restore the original wording of the law. *Action:* Passed in Senate.

Assembly Bill No. 184, reported in April and May. *Action:* Passed in House and Senate, approved by Governor.

MINIATURE FIREARMS

By Stephen V. Grancsay

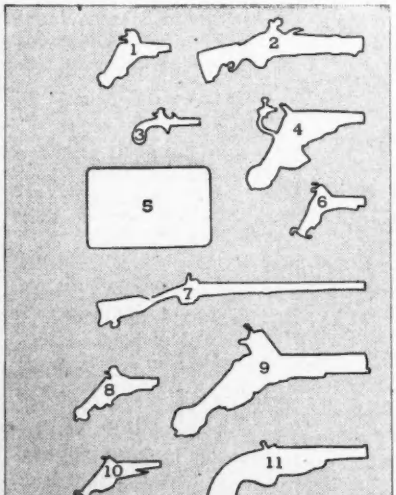
MINIATURE FIREARMS, like those in the Metropolitan Museum of Art illustrated on the cover, were in some cases made by a skilled journeyman to indicate that he was prepared to enter into the promised land of a master. In other cases they were made as toys to provide reliable instruction for princes destined in manhood for warlike pursuits. Some were made by model craftsmen as works of skill, just as one made a tiny watch the size of a dime, while others were made as models to be used by gunsmiths for study and for making improvements.

The weapons of each age have been made in miniature for boys. The military toys of Louis XIII of France when three years old included a little arquebus, a musket with a bandolier embroidered in gold and silver, a pistol, a little cannon of silver given to the boy by Sully when he visited the arsenal, a little bow and arrow, a poignard set with rubies, and many other costly and beautiful toy weapons. These were not mechanical gadgets turned out on the assembly line. They were made by court designers and silversmiths. The soldiers, guns, and war machines of Louis XIV, given to him when he was but twelve years of age, were designed by the sculptor George Chassel and executed by the silversmith Merlin, at a cost of fifty thousand ecus! Toy flintlock guns were popular in Napoleon's time. Before me is an illustration of toy flintlock guns from the pattern book of a toy maker in Paris of this period. Such firearms are not to be confused in workmanship with the American late nineteenth century children's cap pistols which were usually cast in iron, though sometimes they were in bronze, and in size they ranged from only an inch and a half long to one foot.

Gunsmiths were often clockmakers and hence were accustomed to make instruments of precision. Also, early mechanicians were accustomed to build intricate functional models. The Emporer Charles V when he retired to the monastery at St. Juste (1555) spent much of his time in the workshop o his mechanician, Giovanni Torriano, who made among othe things an elaborate astronomical timepiece, a self-acting mil which, though small enough to be hidden in a friar's sleeve could grind two pecks of corn a day; minutemen and horse which fought, and pranced, and blew tiny trumpets, and bird which flew about the room as if alive; toys which, at firs scared the prior and his monks out of their wits, and f awhile gained the artificer the dangerous fame of a wizard. Some of the Emperor's firearms are still in existence, and it i known that he took with him to St. Juste his fowling piece various crossbows, quivers and other trappings of the chase so that we may assume that his interest in firearms would have led him to commission Torriano to build some of thes marvelous mechanical toy firearms.

In our series is an extraordinary wheellock pistol (No. 9) five inches long, rather large compared to some of the pieces The interior of the lockplate of the pistol is shown below and, with the elements dismantled, at right. The elemen shown (at right) above the lockplate are those mounted o the exterior, the remaining elements are mounted on th interior. The elements are: 1) Link supporting the dog piv and spring screw. 2) Dog spring. 3) Pan. 4) Safety hoo 5) Sliding pan cover. 6) Wheel housing. 7—A, B, C) Do upper jaw, and adjusting screw. 8) Safety bridge. 9) Safe spring. 10) Lockplate (inner surface). 11) Pan cov release button. 12) Pan cover catch. 13) Pan cover sprin 14) Axle bridge. 15) Wheel sear (side view). 16) Whe sear and trigger spring. 17) Wheel axle and chain (i plan). 18) Wheel. 19) Mainspring.

Because of its unusually fine workmanship the pistol is co sidered to have been made by an experienced apprentice to b submitted as evidence of completed training. This piec which is illustrated here in detail, could also have served as working model. In favor of the explanation of the practica value of some of these firearms models is the comprehensiv



Numbers identify firearms models on cover

Exact size detail of interior of lock of German wheellock pistol (Nuremberg), 1590

and extraordinary collection of cannon models in the Musée de l'Artillerie in Paris. These were made to one-fourth scale under the direction of Lieut. Général de Gribeauval (1776) when he created a distinct matériel for field, siege, garrison and coast artillery. The models helped him to make the parts interchangeable as far as possible. In the same museum is a one-fourth scale model of the model 1763 Charleville gun (M575), a one-fifth scale model of the model 1822 gun made in 1825 by Jaillet whose name is engraved on the lockplate, and also eight small models of German wheellock pistols (M1697).

The cover illustrates a variety of types, and these vary greatly in quality of workmanship. All of them are in operating condition. Some of them are scale copies which were suspended by the rings they bear from watch chains as ornaments or charms to indicate the profession or hobby of the wearer. Others were made merely as a pleasure and pastime or for demonstration purposes.

The models illustrated on the cover are as follows:

1) Model of wheellock pistol, German (Saxon) 1590.
Caliber .105 Length 1¾ in. Weight 5.6 grams
Steel and brass; the brass mountings are engraved and mercury gilded. The lockplate is stamped with a mark, the letters "W" in a shield.

2) Model of miquelet blunderbuss, Spanish, XVII century.
Diameter of bell mouth 1 1/32 in. Length 4¼ in.
Weight 38 grams
Barrel of steel with forward third of brass, capucine of brass.

3) Model of percussion pistol, French 1860-80.
Caliber .105 Length 1¾ in. Weight 5.6 grams.
Ivory butt; barrel engraved with invected lines and lock engraved with foliation; concealed trigger. To the top strap is secured a ring apparently for suspending from a watch chain.

4) Model of miquelet pistol, German, 1600.
Caliber .155 Length 3 1/32 in. Weight 61 grams.
The stock of copper, engraved and mercury gilded, is that of a wheellock; lock and barrel of steel, the latter stamped with the mark of a pitcher. This miquelet mechanism is a South Italian type. This miniature may well be a gunsmith's experimental model. I have never seen a full sized pistol with this combination of wheellock-shaped stock and miquelet lock.

5) Models of pair of percussion pocket pistols, French, 1860.
Caliber .114 Length 1⅝ in. Weight (each) 6 grams
With powder flask, cap box of ivory full of caps, combination bullet mould, percussion nipple wrench and barrel-wrench, and three lead bullets in compartment.
Pistols with plain ivory stocks; lock, hammer and barrel of steel engraved with foliation and invected lines. Concealed trigger. Ring for suspension secured to under side of barrel; barrels unscrew; size of threads on the barrel is 7-42, on the percussion nipple 1-60.
Case inscribed: CARON
20 PASSAGE DE L'OPERA
et BOULEVARD DES ITALIENS
A PARIS
A. Caron in Paris, in 1868, called himself Arquebusier du Roi. This probably referred to a foreign king, for France at that time had an emperor.

6) Model of wheelock pistol, German, 1580.
Caliber .077 Length 2 in. Weight 13 grams
Stock of brass, mercury gilded, and engraved with checkering and foliation. Lock, barrel, and doghead of steel. S-shaped butt. Two suspension rings on barrel and one on stock.

7) Model of percussion gun, French, Mid-XIX century.
Caliber .105 Length 6 7/8 in. Weight 18 grams
Stock of ebony. Barrel inscribed: F. P. le Capne Millere.

Lockplate of German wheellock pistol (Nuremburg), 1590, dismantled

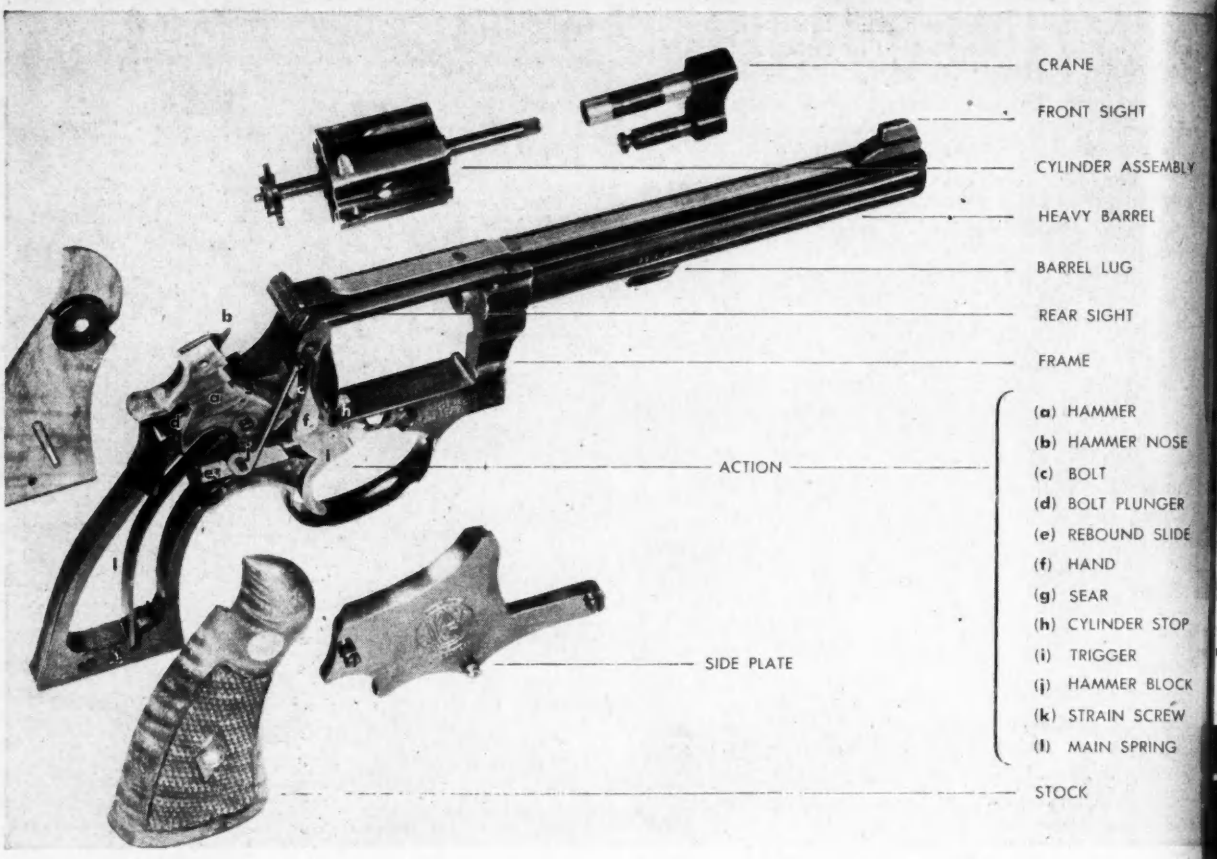
8) Model of wheellock pistol, German, 1590.
Caliber .085 Length 2 1/8 in. Weight 18 grams
Stock of brass engraved and mercury gilded.

9) Model of wheellock pistol, Germany (Nuremberg), 1590.
Caliber .156 Length 5 in. Weight 111 grams
Stock of copper, etched over all with scrolls and mercury gilded; butt embossed and chiseled as a lion's head; steel barrel etched with scrolls and mercury gilded over all; steel belt hook; steel ramrod is not the original. The lock is a masterpiece, being skillfully made in every detail, including a safety. The pistol is in working order.

10) Model of wheellock pistol, German, 1580.
Caliber .067 Length 2 3/16 in. Weight 111 grams
Stock of brass engraved with an anteater (?); S-shaped butt.

11) Model of percussion pistol, Austrian, Mid-XIX century.
Caliber .165 Length 4¼ in. Weight 52 grams
Grip checkered; lock engraved with foliate scrolls and rosettes, and inscribed: Jos. Eberlin Wien.
Rifled barrel with 12 grooves; elongated front sight; grooved rear sight; ramrod lacking. The barrel has straight rifling, and the interior is corroded near the rifling indicating that the piece has been fired. There are two notches on the tumbler, for half cock and full cock.

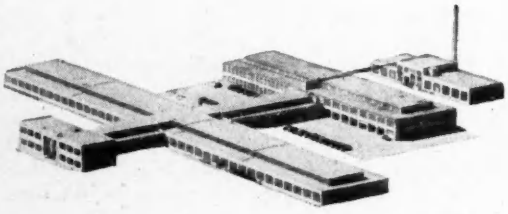
Miniature firearms continue to be so made today. Tiny muskets which conform in minute detail to the arms of the Revolutionary period have been made by National Park Service Museum preparators for display in realistic historical dioramas. And how many miniature models have already been made by hobbyists of the Garand rifle! Model firearms, like those discussed here, have been preserved in the principal European national museums because of the fine quality of their workmanship. ● ● ●



Here, in an exploded view, is Smith & Wesson's new standard production K-38 Masterpiece revolver. Note heavy barrel and wide rib

Smith & Wesson

Photographs by Richard L. Reish

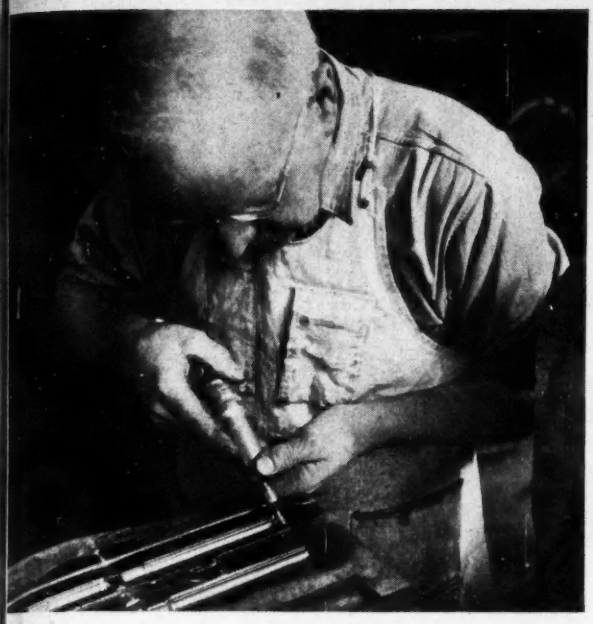


A TRIP THROUGH S&W'S SPRINGFIELD PLANT . . . FIFTH IN THE RIFLEMAN'S PICTURE SERIES ON THE AMERICAN ARMS AND AMMUNITION INDUSTRY

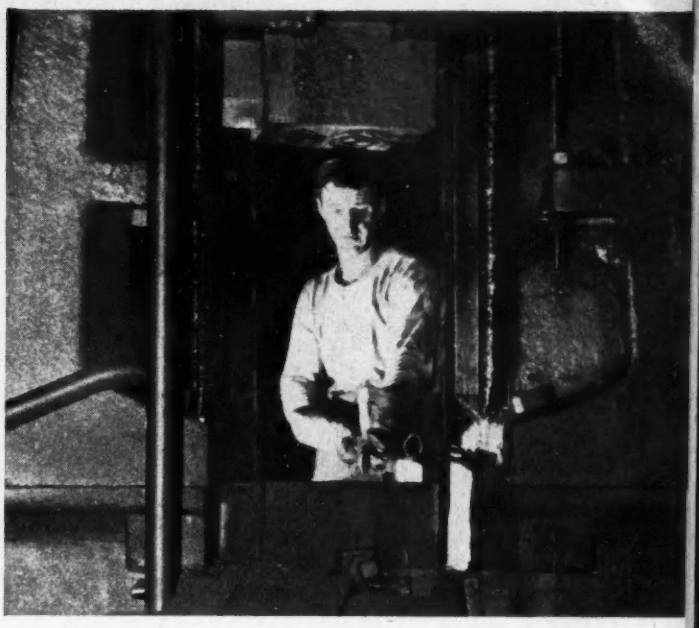
THE NAME Smith & Wesson has become almost synonymous with the word revolver. Though the firm founded in 1851 by Horace Smith and Daniel B. Wesson got its start a few years after Colt organized his Patent Arms Manufacturing Company, the two have since run neck-and-neck in the production of fine American handguns. Last year the RIFLEMAN (page 12, May 1948) introduced to its readers some of the men whose personal skill and knowledge are required to maintain the quality of output of American arms factories. Here, to complete the story, are pictures showing some of the machines and the techniques used in the manufacture of a modern handgun.

In Springfield, Massachusetts, NRA photographer Reish selected the new K-38, which is a new version of the popular, familiar S&W .38-caliber target revolver and followed it through the plant from drop-forging to final packaging. S&W owners will quickly spot some differences between the new K-38 Masterpiece and its predecessors.

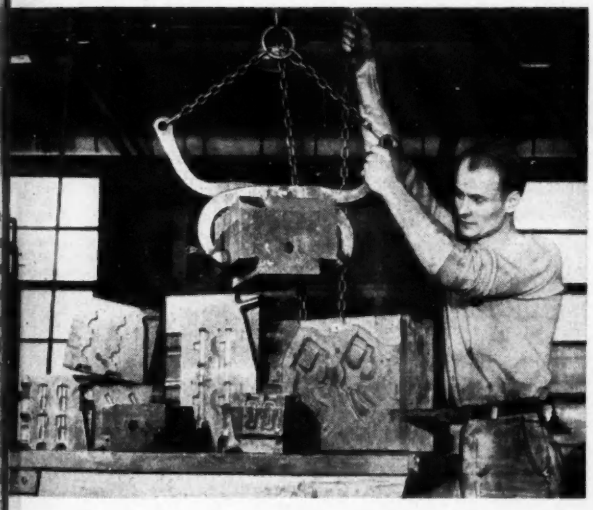
One of the things which cannot be shown is the care and constant inspection which is an ingredient in the manufacture of any good American firearm. In the case of Smith & Wesson's K-38 Masterpiece, more than 1,000 inspections are made of each weapon as it moves along S&W's production line. Incessant hammering at the ideal of perfection, which characterizes the methods of any conscientious arms manufacturer, makes U. S. firearms more costly than they might otherwise be, but it also stands as a guarantee of their excellence and uniformity.



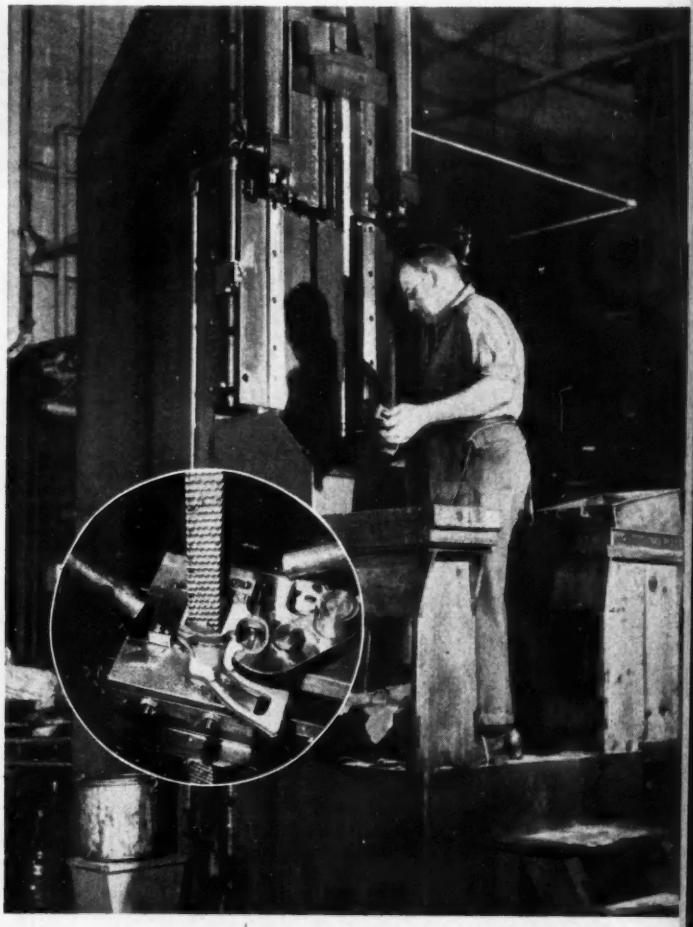
Smith & Wesson makes dies used in drop-forging parts for S&W K-38 revolvers. Workman is shown finishing die for drop-forging K-38 barrels



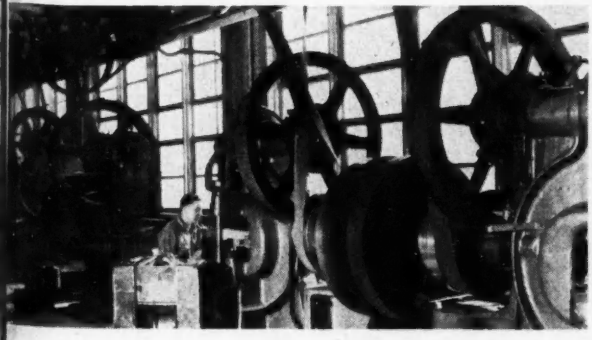
Drop-forging revolver frames. All major parts of Smith & Wesson revolvers, except cylinders and side plates, are forged by company



Some of the dies used in drop-forging components of the K-38 Masterpiece

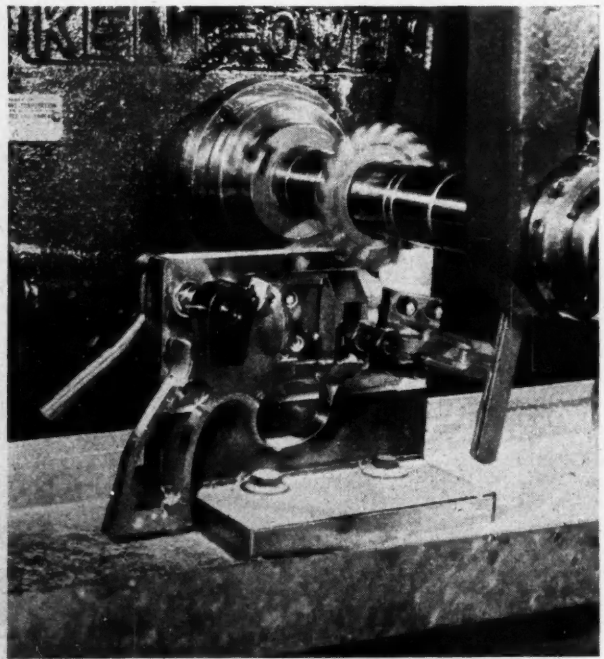


After removing fins, second operation consists of broaching cylinder opening in frame. Job is done by long rectangular bar with four cutting sides (inset)

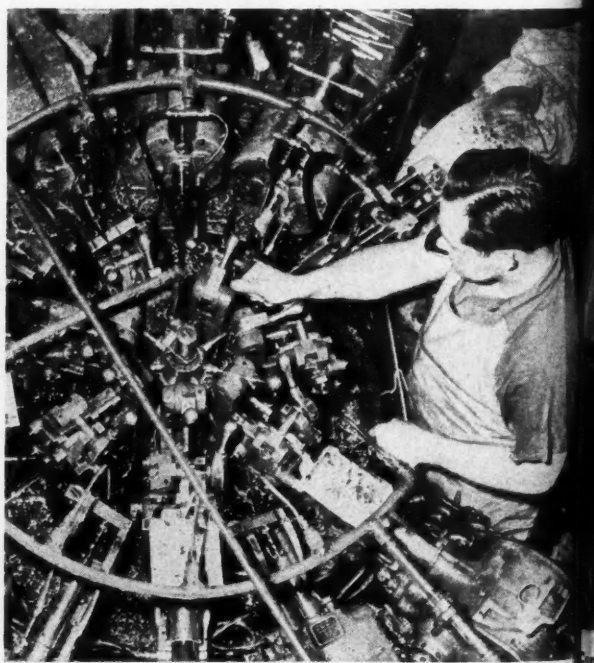


These trimming presses remove flashing from forged parts for S&W handguns. Flashing is excess metal extruded between dies during forging

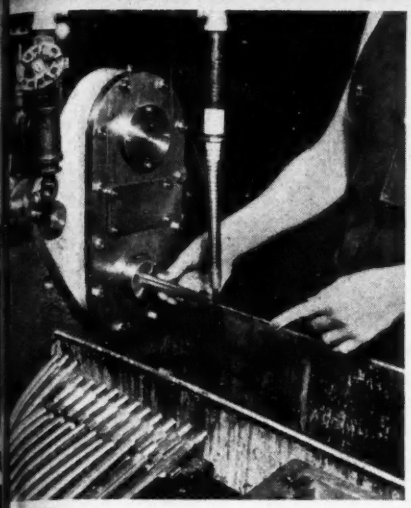
Preliminary step in assembling a Smith & Wesson revolver. This employee is one of the scores of skilled bench workers entrusted with critical phases of manufacture or assembly requiring superb manual skill



Slot for rear sight leaf is milled in revolver frame, the cylinder opening serving as locating point for holding frame on milling machine carriage

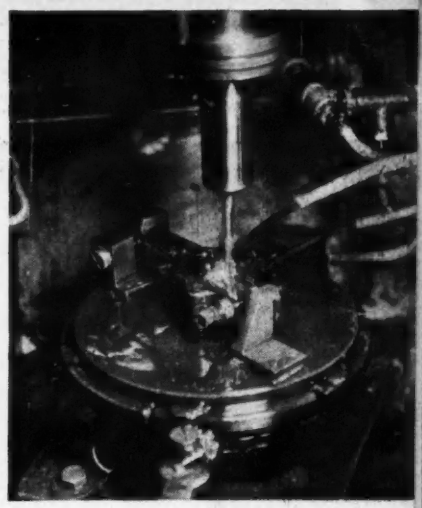


Inter-related drilling, reaming and counter-boring operations in front revolver frame are made with one setting in intricate Kingsbury machi

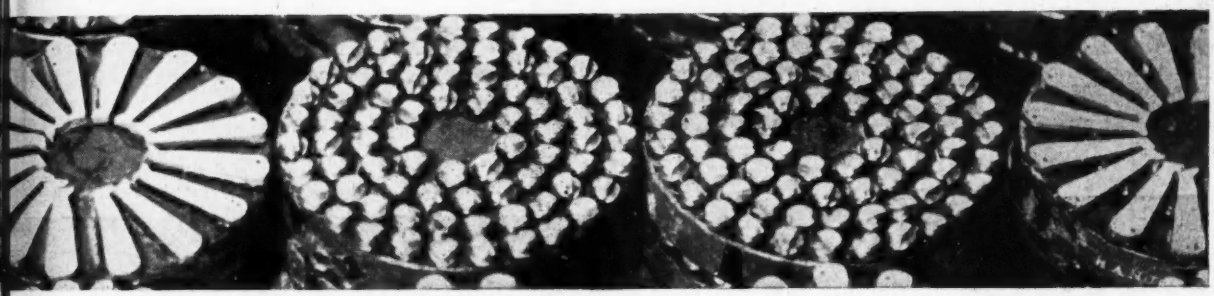


o obtain proper twist of rifling broach is pulled hrough K-38 barrel while it is rotated in oil bath

After rifling bore, barrel is lapped. Lap is made by pouring molten lead into barrel around a steel core

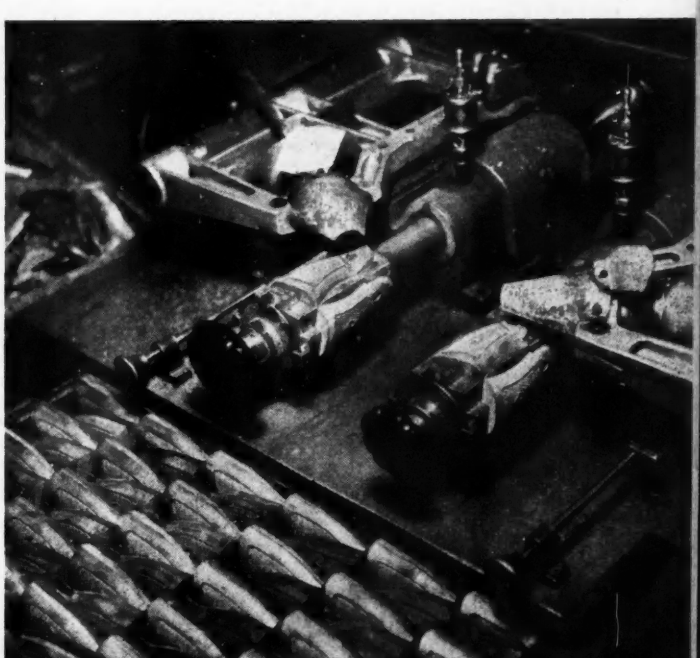


Cylinder is drilled and reamed by machine, reamed by hand and roll burnished



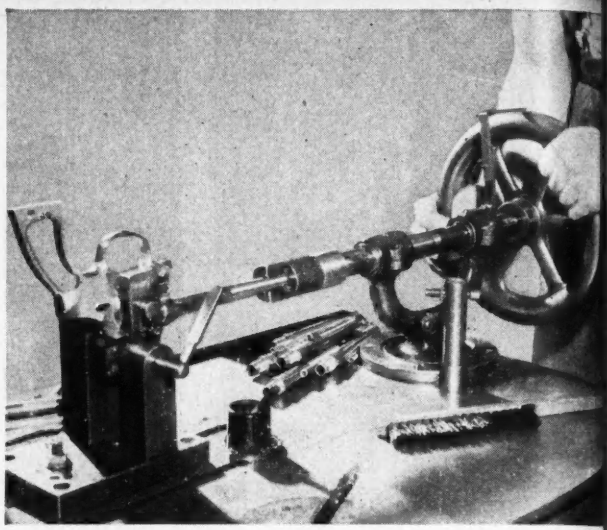
nall parts of the action, called 'lockwork' pieces, are mounted on steel ics in shellac before polishing to exact width and mirror-like frictionless finish

Contoured polishing wheels are used to reach the various curved surfaces of the gun. This workman is polishing Masterpiece barrels



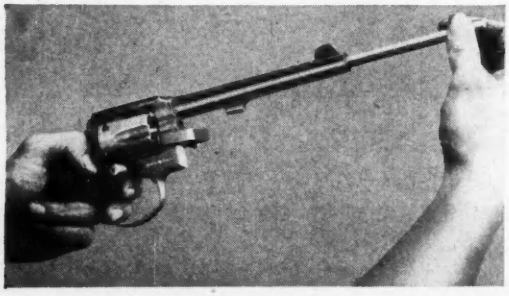
Pistol grips, mounted on automatic tool designed and built by S&W, are checkered by cutters which rotate at 50,000 revolutions per minute

Though main parts of the revolver are 'soft fitted' before finishing, workmen like William Porter make precise final assembly

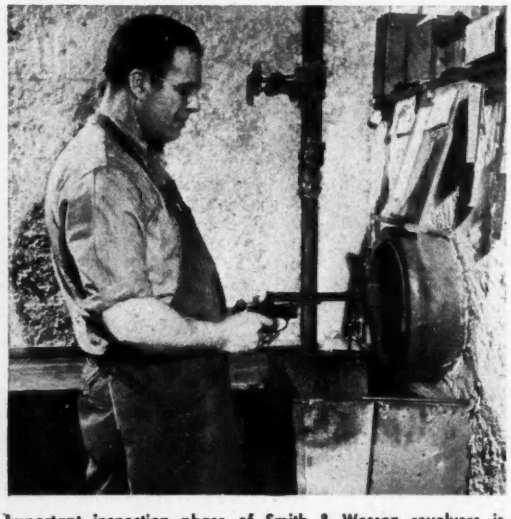


Calibrations on this handwheel indicate exactly the amount of metal wh must be removed from barrel shoulder to fit and align barrel in fra

Last thing done to K-38 by S&W is wrapping for shipment to distribu



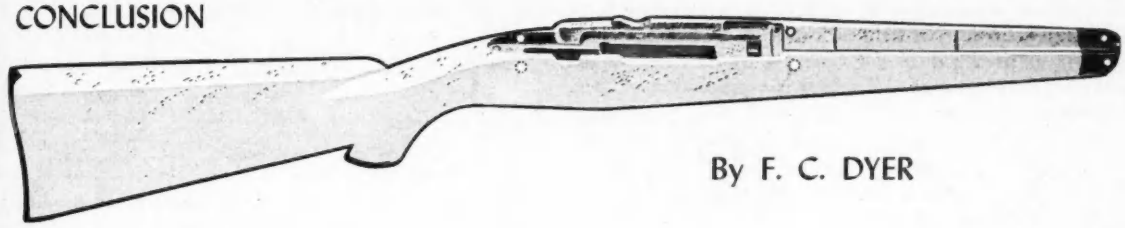
Each chamber in cylinder is checked for alignment with barrel by use of a hardened and polished plug gauge



Important inspection phase of Smith & Wesson revolvers is function firing into sand pit with test ammunition

YOU DON'T BUY ACCURACY

CONCLUSION



By F. C. DYER

In Part I the author stated that after purchasing a heavy-barrel Winchester 52 for his son and witnessing the firing of worse scores than he thought should have been fired, he investigated the bedding of the barrel and action. Finding it unusual, bedded upon rubber inserts on the inside of the stock, Dyer rebedded the rifle in the orthodox manner. Then his son fired a 40-shot group with a .74-inch horizontal spread and 1.53-inch vertical spread. Trying to obtain a group with almost equal vertical and horizontal spread, the barrel band was tightened and another 40-shot group was fired which measured 1.47-inch horizontal spread and .895-inch vertical spread, almost reversing the axes of measurement of the previous group. By loosening the barrel band, the next 40-shot group fired measured 1.11-inch horizontally and 1.53 vertically, indicating an approach to unity of vertical and horizontal spread of the group. Continued adjustment of the barrel band failed to give better grouping even after 6,500 rounds had been fired.

IT WAS DECIDED to go back to the barrel band setting at which we had started as we were convinced that between the neutral position and 2½ turns of the band screw we would find a setting that would produce tight groups. We decided to start from the neutral position and make changes in increments of ¼ turns of the barrel band screw, increasing the tension on the barrel each time in the same direction, and firing a 40-shot string with each change.

All tension on the barrel was removed and by use of the dial gauge the barrel band screw was again set at the point where pressure was beginning to be placed on the barrel, the neutral point again. Groups were then fired with the results as tabulated in Table 5.

Table 5	*Extreme Horizontal*	*Extreme Vertical*
Target 17	.83 inch	1.42 inch
Target 18	.75 inch	1.69 inch
Target 19	.94 inch	1.46 inch
Target 20	.67 inch	1.61 inch
Average horizontal spread 40 shots		.795 inch
Average vertical spread 40 shots		1.55 inch

Comparing this with Table 2, it is seen that we have gone back to our reference point adjustment, for all practical purposes reproducing previous results exactly. A total of 40 ten-shot groups were fired to be sure that targets 17, 18, 19 and 20 were typical. The groups were extremely encouraging. For the first time we were positive that the situation was well in hand, even though we were convinced that the barrel band arrangement was mechanically poor considering the job it had to do.

The barrel band screw was taken up exactly ¼ turn and the next groups fired. Table 6 shows the results.

Table 6	*Extreme Horizontal*	*Extreme Vertical*
Target 21	.67 inch	1.02 inch
Target 22	1.26 inch	.59 inch
Target 23	1.06 inch	1.06 inch
Target 24	1.26 inch	.98 inch
Average horizontal spread 40 shots		1.06 inch
Average vertical spread 40 shots		.912 inch

This is actually not as good a composite group as the dimensions of the axes would indicate because there is still a tendency toward vertical stringing, and, even though the composite group size is smaller than any previously obtained, 14 shots are outside the X-ring. This is an average of 3.5 flyers per 10-shot string which, of course, means that on the average there were 6.5 shots per target in or touching the X-ring. Actually, the targets added up as tabulated in Table 7.

Table 7	*Shots in X-Ring*	*Shots Touching Outside X-Ring*	*Flyers*
Target 22	7	0	3
Target 23	7	0	3
Target 24	6	0	4
Target 25	5	1	4
Total	25	1	14

This group of targets shows a typical condition noted in shooting the series of targets while trying to adjust the barrel band by blacksmith methods. As we changed from a setting with which either vertical or horizontal stringing occurred, as we progressively changed adjustments, we obtained tight groups but we also obtained a few very pronounced flyers. The main groups of this series of targets averaged as follows:

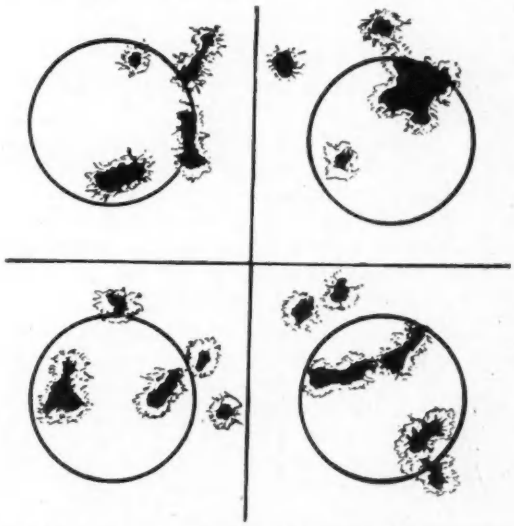


Fig. 6: These actual size groups, with spreads slightly under an inch, are the best attained with match rifle in rebedded stock

extreme vertical spread .699 inch; extreme horizontal spread .6 inch. If we could pull the flyers in we would be in good shape—and don't make the mistake of blaming the flyers on the ammunition.

The barrel band was taken up another ¼ turn and another series of targets fired. No sight adjustments were made, *and Target 26 was fired out of the same box of ammunition as Targets 22, 23, 24 and 25.* Table 8 is a tabulation of this series of targets.

Table 8	*Extreme Horizontal*	*Extreme Vertical*
Target 26	1.06 inch	.90 inch
Target 27	1.26 inch	.86 inch
Target 28	1.10 inch	1.14 inch
Target 29	.86 inch	1.30 inch
Average horizontal spread 40 shots		1.75 inch
Average vertical spread 40 shots		1.65 inch

Considering only the lengths of the axes of the composite groups, this seems to be worse than the previous groups, but we should note that the groups are very nearly symmetrical in that there is only .1-inch difference in length of the major and minor axes. In this group we have 8 shots outside of the X-ring or an average of 2 per 10-shot group, an improvement of fifty percent. On Target 26, which was fired from the same box of ammunition as the groups in Tables 8 and 9, we have only one flyer compared to the average of 3.5 flyers for the targets of Table 7. Table 9 gives the distribution of shots for the 40-shot group.

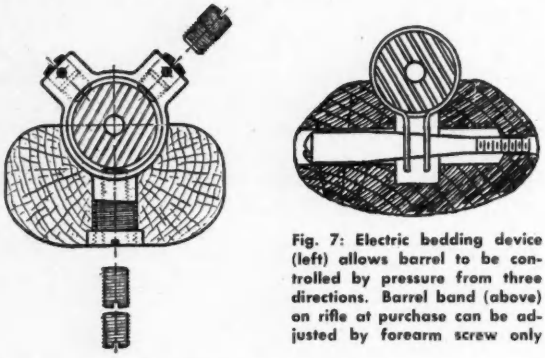


Fig. 7: Electric bedding device (left) allows barrel to be controlled by pressure from three directions. Barrel band (above) on rifle at purchase can be adjusted by forearm screw only

Table 9	*Shots in X-Ring*	*Shots Touching Outside X-Ring*	*Flyers*
Target 26	8	1	1
Target 27	6	0	4
Target 28	7	1	2
Target 29	7	2	1
Total	28	4	8

Disregarding the flyers, the main groups of this series of targets averages as follows: extreme vertical spread .895 inch; extreme horizontal spread .82 inch. It would seem that we have a deterioration here in that the group is generally a little larger than the previous one, but we must take into consideration the reduction in flyers and the fact that the composite group is much more symmetrical than any of the others.

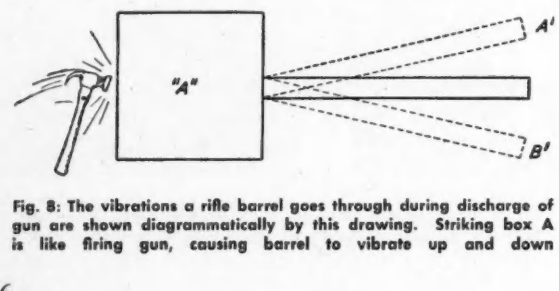


Fig. 8: The vibrations a rifle barrel goes through during discharge of gun are shown diagrammatically by this drawing. Striking box A is like firing gun, causing barrel to vibrate up and down

We took up the barrel band adjusting screw another ¼ turn and fired another 40-shot string. Targets 30, 31, 32 and 33 (Fig. 6) are the results. One click of right windage was taken after Target 30 was fired. Table 10 is a tabulation of extreme spreads of the four targets.

Table 10	*Extreme Horizontal*	*Extreme Vertical*
Target 30	1.06 inch	.87 inch
Target 31	.90 inch	.63 inch
Target 32	.83 inch	.95 inch
Target 33	.71 inch	1.02 inch
Average horizontal spread 40 shots		.923 inch
Average vertical spread 40 shots		.911 inch

Well, the road was long, but at least we had produced four consecutive targets averaging slightly less than one inch or a little better than what we had originally decided the equipment must do. We didn't like the seven shots outside the X-ring but experience had made us somewhat cautious. It was decided to leave well enough alone, considering that the barrel band was a pretty crude device from a resetability standpoint —anyway, by now we had some new theories about the whole accuracy problem.

During the next three weeks, we fired a total of 80 more targets. The composite average spread for the 84 targets was 1.12 inch for the horizontal axes and 1.02 inch for the vertical axes, which isn't too bad, considering the fact that the ten-ring is 2 inches across.

Another reason why we decided to stop trying to improve groups was because we had decided to have an electric bedding device (Fig. 7) installed. We wanted a barrel band which would permit exact 'resetability' for further testing; in view of the fact that the electric bedding device is equipped with micrometer click adjustments, it certainly should fulfill the requirement. Also, we didn't like the idea of having the barrel and fore-end under tension at all times, which it was with the factory barrel band. It seems reasonable to believe that tension will inevitably aggravate stock warpage problems, plus the fact that the barrel itself will eventually take a permanent set since there are other ways of permanently deforming a steel bar besides exceeding its elastic limit.

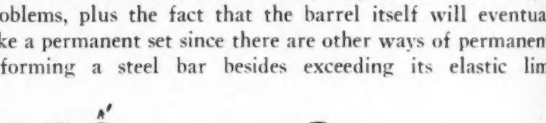


Fig. 9: A pencil fastened to the muzzle of a rifle would draw a curve similar to this on a sheet of paper moving at constant speed

Also, we were still disturbed about the necessity of occasionally moving the sight laterally as we changed barrel band adjustments. Study of our barrel band assembly had convinced us that it would be impossible to overcome the condition because each time an adjustment is made the device inherently places lateral pressure on the barrel as well as in a direction perpendicular to the bore. This is readily apparent from a study of Fig. 7.

The adjustment screw being a cone, it of course tries to force the barrel band sideways as well as pull it down. It should be remembered also that the barrel is resting on two rubber bumpers and one or the other of them is going to compress, which would result in an uneven damping effect. Also, it is conceivable that under some conditions (such as when the barrel vibrates) the strains due to friction between the cone and the barrel band, and the compression strain

on one or the other of the rubber bumpers, will try to equalize themselves, which could result in slight variation of pressure from shot to shot. This might account for some of the bad flyers.

As long as we are speculating on the causes of poor groups, let's see if we can't figure out a reason for the stringing that had been observed, targets 5, 6, 7 and 8 (Fig. 4) being typical examples of a group configuration that was quite frequently observed. Let us take a look at what kind of mechanical device a rifle is.

The rifle certainly can be represented as shown in Fig. 8.

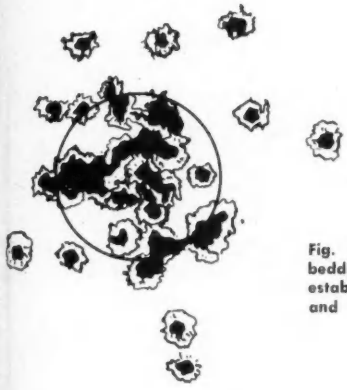


Fig. 10: After installing electric bedding device on his rifle, Dyer established contact with barrel and fired this 40-shot group

'A' represents the mass of the action and stock, 'B' the steel rod which is the barrel. If we hit the mass 'A' a blow with a hammer, a shock will be transmitted which will start two waves travelling down the barrel, one being the pressure wave which results in the barrel alternately expanding and contracting and the other being a wave which is due to the sheer strain transmitted to the barrel. The waves result in the end of the barrel moving back and forth between position A^1 and B^1, in other words the barrel starts to oscillate. It is, of course, obvious that the end of the barrel can't move simultaneously with the application of the shock. The period of time required to travel down the barrel is a function of the density and elasticity of the medium through which the wave is travelling. How fast the barrel moves from point A^1 to B^1 is determined by the frequency of oscillation, expressed in cycles per second, which is the number of times per second the barrel moves from its neutral point to A^1, back through the neutral point to B^1, and back to the neutral. The natural frequency of any oscillating object is determined by its physical characteristics and, to some extent, in the case of a string or rod, by the amount of tension it is under.

Let's draw a picture of the gyration that the end of the barrel goes through while it is oscillating. After all, we aren't particularly concerned with what contortions any point along the barrel goes through as long as we can control things during the instant the bullet leaves the muzzle. Assume that we have fastened a pencil to the barrel at the muzzle and the point is resting on a sheet of paper which by some clockwork mechanism moves laterally at a constant rate of speed. We pull the trigger and, after a period of time, the striker delivers a blow which starts the barrel oscillating at some frequency or combination of frequencies. Upon looking at the sheet of paper we find that the pencil has traced a curve of the shape shown in Fig. 9, the horizontal axis being time and the vertical axis being amplitude or barrel displacement.

While this was going on, the primer had exploded and delivered another shock to the barrel which may or may not —probably not—contribute to our troubles. At some period of time after the primer ignition, the powder started to burn and the bullet started on its way through the barrel at an ever-increasing rate until it reached muzzle velocity. With the muzzle moving in a direction at right angles to the line of flight of the bullet, the bullet is going to be deflected in either an upward or downward direction by an amount determined by its mass, its velocity, and the rate of speed at which the muzzle is moving. What can we do about it?

Let's take a look at Fig. 9 again. The curve is called a sine curve and it has one fortunate property in that at certain points it has a value of zero—just a way of saying that any given object can't move in two directions simultaneously. The two points on the curve when the muzzle has stopped all movement are designated A^1 and B^1. If we can be sure that the bullet is always leaving the muzzle at the moment the barrel is at one of these points, barrel vibration can't affect the bullet's flight. The bullet can't be stopped at the muzzle to wait for the barrel to come to rest, but some measure of control can be attained by seeing that the frequency of vibration is such that the bullet will always arrive at the muzzle at exactly the instant the muzzle is at rest. The only way to obtain some measure of control over frequency of vibration is by having a precise method of controlling the tension on the barrel. The electric bedding device seemed to satisfy these requirements.

To get some idea of what could be the effect of the vibration on the bullet, assume that the barrel is vibrating at a frequency of 1,235 cycles per second and has an amplitude of .01 inch. A simple calculation shows that the bullet would be deflected downward with a velocity of about six feet per second, equivalent to about four or five degrees of angle for bullets of .22 rim-fire velocity ranges.

It seems logical to assume that barrel vibrations could be the cause of vertical stringing. When we consider the fact that under any set of conditions only certain frequencies have time to arrive at the muzzle before the bullet does, we may have a possible explanation as to why a particular rifle will shoot one make of ammunition better than another. If we assume only a minute difference in firing time of the primer mix, we can have a whole new set of frequencies to deal with at the muzzle.

Fig. 11: This is the goal author Dyer was seeking in his experiments, groups with vertical and horizontal axes under one inch. Groups were obtained after installing bedding device and applying upward tension to barrel

What we set out to do was to shoot small, symmetrical groups, so let's see what improvements resulted from the new barrel band. When the rifle was returned from Al Freeland's, we decided that the first groups would be shot with the barrel in its neutral position, so all the adjusting screws were backed off to allow the barrel to assume any position it would with the fore-end. Then, the top two screws were taken up until they made contact with the barrel and the bottom screw was taken up so that the barrel was held against the top screws and there would be no strain on the barrel. After sighting in, we fired our first series of four targets, 34, 35, 36 and 37. The results are shown in Fig. 10. Table 11 is a tabulation of extreme spreads for the four targets. *(Continued on page 42)*

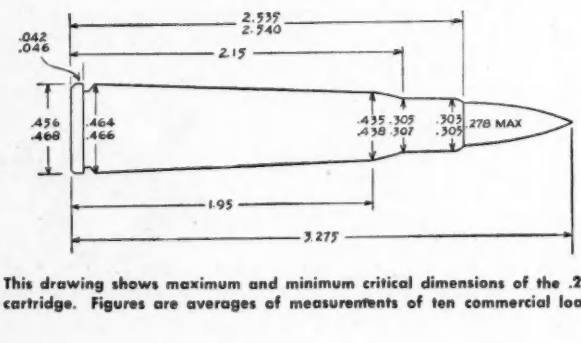
LOADS FOR THE .270

This article on handloads for the .270 Winchester is the fourth of an important RIFLEMAN *series covering the more popular American rifle and pistol cartridges. The first in the series was "Loads for the '06"* (RIFLEMAN, *April, page 28), the second was "Handgun Handloads"* (RIFLEMAN, *May, page 32), and the third was ".257 Roberts Loads"* (RIFLEMAN, *June, page 32).*

Preparation of the material for these articles was handled jointly by the NRA's Al Barr and the H. P. White Company of Cleveland, Ohio (see RIFLEMAN, *November 1948, page 21). Five rounds of each load, made up with fresh components, the powder charge carefully weighed, and loaded with bullets weighing within one percent of catalogued weight, were checked for average velocity figures. The loads were tested for pressure in a barrel of .270-inch bore diameter, .2785-inch groove diameter, 24 inches long, rifling one twist in ten inches, in a Modern-Bond universal receiver. Velocities were measured on a Potter electronic counter chronograph. Room temperature was maintained at 76 degrees.*

☆ ☆ ☆

ONE OF THE MOST common requests made by shooters today is for a comparison of the .270 Winchester center-fire cartridge with the .30-'06 for all-around use. Some .270 owners and users have, from experience with the .270 cartridge,



This drawing shows maximum and minimum critical dimensions of the .270 cartridge. Figures are averages of measurements of ten commercial loads

claimed it better than the .30-'06 for use on animals up to game as heavy as the moose and the Alaskan Brownie. It is true that very high velocity is attained with the .270, higher velocity than is achieved with the .30-'06. For instance, the 130-grain bullet in the .270 is driven at higher velocity than a 150-grain bullet in the '06, and a comparison of these two bullet weights would be a fair one. It is hardly fair, however, to compare directly the ballistics of a 150-grain bullet in the .270 with the ballistics of an equal weight bullet in the '06.

The .270 Winchester center-fire cartridge was especially designed by the Winchester Repeating Arms Company for use in their model 54 bolt-action rifle. Phil Sharpe has reported that he saw the cartridge and rifle in the development stages in 1923. The first public mention of either the round or the weapon appeared in the Winchester Catalog No. 83 for the year 1925 and in a comprehensive article by E. A. Price in the July 1, 1925, issue of THE AMERICAN RIFLEMAN.

The cartridge was a purely commercial development for the benefit of the sportsman, offering him higher velocity, flatter trajectory and about twenty percent less recoil than the .30-'06, its nearest competitor at that time. The ammunition was first loaded only with a 130-grain soft-point bullet and gave a muzzle velocity of 3160 feet per second. Since the load was inclined to break up on some types of game, a 150-grain bullet load which had a muzzle velocity of 2775 feet per second was made available later.

In designing the .270 WCF, the .30-'06 case was used and the length of the shoulder increased while retaining the original shoulder angle. The length of the neck was made the same as the .30-'06. It will be noted that with such a construction the .270 has the same headspace as the .30-'06, and consequently the same headspace gauges may be used interchangeably. Because of the shoulder, the .270 case is approximately .01 inch longer than the .30-'06.

For many years it was necessary for ammunition manufacturers to maintain minimum pressures in loads for the .30-'06 because of the many weapons of that caliber in use which were of questionable strength and had unknown tolerances. With the new .270 it was possible to load to higher pressures since the model 54 was the only commercially available rifle chambered for the cartridge. The model 54 was manufactured under carefully controlled conditions and it was quite capable of handling safely the higher pressures of the more efficient .270 loads.

At the present the .270 chamber is available in two standard commercial rifles, the Winchester model 70 and the Remington model 721 (the Winchester model 54 was discontinued in 1936). The .270 ammunition is manufactured at present in an assortment of expanding-type hunting bullets in various weights and corresponding muzzle velocities: 100-grain at 3540 f.s., 130-grain at 3140 f.s., and 150-grain at 2770 f.s.

Writings contemporary with the first appearance of the .270 cartridge praised it as being a truly noteworthy addition to American hunting equipment. This reputation is still maintained despite the passing of the years, since even today most authorities consider it one of the finest all-around high-power game cartridges on the market.

If a fair comparison between the .270 and .30-'06 cartridges is to be made, a good bolt action should be used and '06 loads built up to pressure levels equal to those of .270 loads, and then the velocity figures compared. With equal pressures the '06 gives almost equivalent velocity figures, as flat trajectory and, with the heavier bullet, greater energy than the .270

The .270 Winchester may readily be loaded to 55,000 pounds pressure, or pressures approaching that figure, as will be noted in Table 1. In making tests of .30-'06 loads (RIFLEMAN, April, page 29), a 2980 f.s. velocity load at the same pressure level was developed wth the 150-grain Bronze Point bullet. Comparatively, then, the difference in velocity for the two bullets in the two calibers is around 100 foot-seconds and the two cartridges have practically the same trajectory. At long ranges the 130-grain bullet in the .270 may hold up a little better than the .30-'06 150-grain because of its sectional density, which is an indication of a bullet's ability to overcome air resistance. The 150-grain bullet in .30 caliber has a sectional density of .214 and the 130-grain .270 bullet has a sectional density of .242. A bullet weighing 168 grains in the 30-'06 has practically the same sectional density as the 130 in the .270.

By one method of obtaining the ballistic coefficient, the 130-grain .270 bullet with a six-caliber point shape has a coefficient of .415. A 150-grain bullet in the '06 with the same nose shape has exactly the same ballistic coefficient, an important factor in determining remaining velocity. The 150-grain bullet in .30 caliber is over fifteen percent heavier than the .270 130 grain and the added weight helps offset the slightly higher velocity of the 130 grain in the .270 caliber.

Practically the same comparison can be made for the 150-grain bullet in the .270 with a 180 grain in .30 caliber when loaded to the same pressure level. Naturally the comparison applies only to heavy handloads in .30 caliber against factory loads in the .270. When comparing factory loads of both calibers, the .270 has flatter trajectory at higher velocity.

There is no question about the .270 Winchester cartridge being an accurate, as near all-around cartridge for hunting anything from varmint to big game as we have. An indication of why it is can be found by noticing the loads which were selected for the pressure and velocity data because they had been used and found very dependable. Fortunately, every one of them is perfectly safe in good .270 rifles, as pressures are within accepted pressure limits, well under the maximum. The loads need no explanation except that it was surprising to find pressure so low for load four, which uses the 100-grain Speer bullet. Load four is, however, very accurate in most rifles and we have increased the charge several grains with nearly as good results. Possibly load five would be heavy in some rifles.

Loads seven and eight are very accurate in most rifles, probably because velocity is around the 1700-1800 foot-seconds level. The two loads are used regularly with the excellent Bond-Loverin gas-check bullet No. 280780 weighing 109 grains. Another good load with the same bullet is that developed by Paul Mansfield, New Boston, N. H., four grains of Pistol Powder No. 6 and 14 grains of No. 4198, which shot into less than 2 inches at 100 yards in one rifle. Another accurate load uses three grains of Bullseye and 17 to 19 grains of No. 4895 powder. One more good load is 12 to 13 grains of No. 2400 and 24 grains of IMR 3031. About 15 grains of No. 4227 works well also.

The one bullet we did not have at the time pressure and velocity figures were obtained was the 160-grain Barnes. Several reliable reports on it have been received, however, which show that the 160-grain bullet has been used with as much as 53 grains of No. 4350 and RA No. 9½ primers. Considering the results obtained with the 150 grain, the charge should be maximum in any rifle. In looking over the velocity obtained using 57 grains of No. 4350 with 130-grain bullets and 53.5 grains of the same powder with the 150-grain bullet, it seems that No. 4350 powder apparently performs its best in the .270 cartridge with bullets of heavier weight. IMR No. 4320 is also a very good powder to use in the .270 cartridge with the 130-grain and even the 100-grain bullet. Perhaps the most consistently accurate load we know of, judging by reports from many different sources, is 51 grains of 4320 with 130-grain bullets.

Recently we have been loading cartridges regularly with IMR 4895, lot 27277, and very good results have been obtained using 51.5 grains with 120-grain Barnes bullets. A favorite load with the 130-grain bullet, although near maximum, is 49.5 grains of 4895, which is exceptionally accurate. An FN .270 rifle shoots best with the load using

Manufacturers' Specifications for .270 Loads

	100 Grain Soft Point	130 Grain Pointed Expanding	150 Grain Soft Point
Velocity, Foot Seconds			
Muzzle	3,540	3,140	2,770
100 Yards	3,210	2,820	2,490
200 Yards	2,890	2,530	2,220
300 Yards	2,600	2,260	1,970
Striking Energy, Foot Pounds			
Muzzle	2,785	2,850	2,560
100 Yards	2,290	2,295	2,065
200 Yards	1,855	1,850	1,645
300 Yards	1,500	1,470	1,295
Midrange Trajectory, Height, Inches			
100 Yards	0.4	0.5	0.6
200 Yards	1.5	2.0	3.0
300 Yards	4.5	5.5	7.0
Sighting In, Iron Sights, Inches			
100 Yards	1.5 high	2.0 high	2.5 high
200 Yards	On aim	On aim	On aim
300 Yards	6.5 low	7.5 low	11.0 low
400 Yards	18.5 low	23.0 low	33.5 low
500 Yards	40.5 low	40.0 low	72.5 low

TABLE 1: Pressure and Velocity of .270 WCF Loads

Load	Bullet: Weight	Bullet: Type	Bullet Diameter	Seating Depth	Charge Grains	Powder	Lot Number	Primer	Case Make	Velocity 20 Feet	Pressure Lb.Sq. In.
1	130	Silvertip	.277	.34	51.5	4320	20	WRA 120	WRA	3,066	50,940
2	130	Silvertip	.277	.34	57.0	4350	10	WRA 120	WRA	3,141	51,960
3	130	Silvertip	.277	.34	50.0	4895	27277	WRA 120	WRA	3,075	52,720
4	100	Speer SP	.2765	.18	54.5	4320	20	WRA 120	WRA	3,304	43,520
5	150	Speer SP	.277	.39	53.5	4350	10	WRA 120	WRA	2,909	53,880
6	111	B&M No. 279111	.280	.31	8.0	Unique		WRA 115	WRA	1,379	
7	104	Gas Check	.280	.24	19.0	4198	8 C	WRA 115	WRA	1,750	
8	104	Gas Check	.280	.24	16.0	4759	2 C	WRA 115	WRA	1,767	
9	130	Commercial load								3,153	53,500

TABLE 2: Drop Figures for .270-Caliber Loads

Cartridge	Bullet: Weight, Type	Load	Above Aim 100 Yards	200 Yards	Below Aim 300 Yards	Below Aim 400 Yards	Below Aim 500 Yards
.270 Winchester	130 M&G	49.5 grs. 4895	1.78 in.	On aim	6.60 in.	19.13 in.	44.60 in.
.270 Winchester	140 MGS	57.0 grs. 4350	1.60 in.	On aim	7.20 in.	20.35 in.	42.00 in.
.270 Weatherby Magnum	130 M&G	67.0 grs. 4350	1.65 in.	On aim	7.85 in.	18.80 in.	40.75 in.
.270 Weatherby Magnum	140 MGS	67.0 grs. 4350	1.85 in.	On aim	6.05 in.	17.00 in.	40.25 in.

.033-inch Ipco wads. One of the best bullets for use in the FN rifle is the latest 130-grain M&G. It is still made of copper tubing but with a completely enclosed base. Using loads made up with 4895 powder, 130-grain M&G bullets, and .033-inch Ipco wad, the FN rifle will shoot under 1½ minute-of-angle groups regularly with 80 percent of the shots in 1 to 1¼ minutes.

Another equally accurate bullet in the .270 FN rifle is the latest 140-grain Modern Gun Shop bullet, which has a new 2-diameter design and a pencil point. The point tapers at approximately a 70-degree angle. The cylindrical base end of the bullet measures .2775-inch diameter for .45 inch forward of the base. The bore-riding section tapers from .269 to .271 inch.

The 140-grain M&G bullet is very accurate also in the .270 Weatherby-Magnum with full loads. With the regular load of 67 grains of 4350 in the Weatherby-Magnum the bullet gave two consecutive groups with four shots out of five well under an inch at 100 yards. Probably because of the 2-diameter construction, we seem to be able to use exactly the same loads in the .270 and in the Weatherby-Magnum as we do with regular 130-grain bullets. No doubt one reason is that the bullet can be seated farther out of the case. A .285-inch seating depth is used in the .270.

More new bullets for the .270 are the Barnes 100 and 120 grains with jackets made from drawn copper alloy cups instead of copper tubing. They are nice-looking bullets and they shoot well too. Using 100-grain Barnes or 100-grain Speer bullets, we have had excellent loads with 53 grains of 4895 and Winchester 120 primers.

In Table 2 the trajectory of .270 Winchester shows up nearly as well as the .270 Weatherby-Magnum, using the same bullets. The comparative results were fired on the same day under the same conditions, ideal for the test. The figures represent only one test over the 500-yard range, and equivalent sighting equipment was used. A K4 Weaver was mounted on the .270 Winchester and a 4X Hawk on the .270 Weatherby, at equal height above the barrel. Probably no fairer comparison could be made between the two cartridges, although we were using maximum loads in the .270, while a grain or two more powder can be loaded in the Magnum. The loads selected were the most accurate of the loads used regularly. Perhaps a grain or two more powder in the Magnum would have shown better drop results.

Almost a direct comparison can be made between the .270 and the .270 Weatherby-Magnum cartridges when using 130-grain bullets, the Magnum cartridge giving 3335 foot-seconds muzzle velocity and the 270 load we used giving 3100 foot-second velocity. Drop figures for the two loads verify the slightly higher velocity obtainable with the Magnum cartridge. Loads with the new 140-grain MGS have not been chronographed yet, but the drop figures, which we consider reliable, indicate about the same velocity in the two cartridges.

The Magnum gave very good hunting accuracy at all ranges, but the FN .270 accuracy was outstanding. In fact, except for a few fliers, the majority of the shots from the .270 went into less than 1¼ minutes of angle at all ranges. We had consecutive 5-shot groups of 5.64 inches and 5.65 inches at 500 yards with the two different bullets.

The .270 Winchester cartridge is noted for its accuracy, the reports on it coming from those using standard to medium weight sporters. Sometimes we wonder how accurate the cartridge might be when used in a heavy bull gun. Taken as a group, .270 sporting rifles do seem to be more accurate than the average run of .30-'06 with sporting weight barrels. Furthermore, many of the .270 rifles handle the light 100-grain bullet exceptionally well.

One other advantage of the .270 is that quite frequently even sporting rifles will shoot to approximately the same zero with bullets weighing from 100 to 150 grains. In fact, in the 500-yard drop test the FN rifle, using the 130- and 140-grain bullets with two different kinds of powder, shot to so nearly the same zero at all ranges that there would have been no need for a sight adjustment of any kind. The 130 grain landed ½ inch higher than the 140 at 100 yards, and exactly the same distance below aim at 500 yards, before any corrections were made to bring the loads to point of aim at 200 yards.

For all-around use, where plenty of power is needed, the efficient .270 cartridge is really hard to beat. ♦ ♦ ♦

NEXT MONTH: *In plenty of time for hunting-season preparations, popular outdoor writer Bud Jackson passes along some tips on outfitting for your big-game trip . . . and Elmer Keith talks about the animal he considers North America's toughest critter. For the home-workshop man, there'll be some notes on a home-made muzzle brake for the Enfield . . . for scattergunners, Colonel E. H. Harrison on the hows and whys of shotgun mechanisms . . . part two of Peyton Autrey's ballistics series . . . and for the fair sex, a fashion note on 1949 rifle-range costume.*

International and National Matches

INTERNATIONAL MATCHES

The information on 1949 International Matches has changed very little from that published in the June RIFLEMAN. The U.S. will be represented in Buenos Aires by a team which will fire in both the rifle and pistol matches of the International Shooting Union, November 4th to 13th.

Last year, following the Olympic Games, the U. S. teams recommended that future representation consist of one rifle team to fire both free rifle and small bore and one pistol team to compete in both slow- and rapid-fire competition. Otherwise, no team has enough shooting to really do its best. Therefore, and because of the difficulty of picking team members who can be away for the length of time required, it seems probable that the teams this year will consist of six riflemen and six pistolmen.

Present plans call for the rifle team to consist of the winner in the big-bore free rifle tryout, the winner in the small-bore tryout matches and the four shooters with the highest composite big-bore and small-bore scores. The same plan is expected to be followed in the pistol team selection, the high scoring slow-fire shooter, high scorer in rapid-fire events, and the four high shooters for combined slow- and rapid-fire scores making up the team.

Small-bore rifle team tryouts will be held on Monday, September 5th at Camp Dodge, Iowa. Pistol tryouts will be held at Fort Sheridan on September 5th and 6th. The big-bore free rifle tryout will probably be held at Camp Dodge (or nearby) following the small-bore tryouts over Labor Day. Due to the uncertainty of the hoped-for .30-caliber matches this fall, the exact time and conditions of big-bore free rifle tryouts cannot be decided upon just yet. As soon as the details are known however, all clubs will be informed and the information will be published in the RIFLEMAN.

Those who wish to train over the tryout courses should fire the big-bore free rifle at 300 meters (or yards) in the prone, kneeling and standing positions. Small-bore shooters should fire in the same positions at 50 meters. The tryout course will probably consist of 40 shots in each position.

Position rules permit the use of a palm rest in the standing position, but not in kneeling or prone. The sling may be used in kneeling and prone positions however. In kneeling, either the NRA or the International position is permitted. In the International kneeling position a sandbag eight inches long and four or six inches in diameter must be used between the instep and the ground.

The International Team and Equipment Committee in charge of tryouts and tryout conditions consists of Major General Julian S. Hatcher, Brigadier General Sidney R. Hinds and Mr. Frank Parsons. Letters to the Committee may be sent in care of the NRA Washington office.

Pistol shooters should train over the 50 meter (or yards if no meter range is available) slow-fire course, and over the rapid-fire 25 meters, five silhouette International Course. Any .22-caliber pistol, including free pistols with set-triggers may be used.

See the April, 1948 AMERICAN RIFLEMAN, page 22 for details on all International Courses but note the above regarding the kneeling position change.

All types of International targets are available from the National Target Company, 1255 - 25th Street, N.W., Washington, D. C.

NATIONAL .30-CALIBER MATCHES

Determined efforts are still being made to have funds included in the Military Establishment Budget, when passed by Congress, for the 1949 .30-caliber National Matches. What the final outcome will be, no one can now foretell and no information is expected until the budget is voted on about July 1.

In case National Match funds are not included, the Army has been requested to arrange to hold a .30-caliber rifle tournament on an Army post where targets and personnel are already available. Such matches would require great curtailment of the usual Camp Perry program, but some of the 'name' events could be included in the schedule—which ones depending upon the range facilities. Whatever matches are held will undoubtedly be fired late in September or during early October.

When any new information becomes available on .30-caliber matches, it will be sent to all clubs immediately and published in The RIFLEMAN.

NATIONAL SMALL-BORE CHAMPIONSHIPS

As previously announced, the National Small-Bore Championship this year will be fired on the Camp Dodge range just outside Des Moines, Iowa. The time will be over Labor Day. Eligibility for the Nationals is as stated in the June RIFLEMAN. The important requirement to remember is that each regional competitor who can compete if he becomes eligible must make entry on the card available to him at the regional and must mail the entry to NRA Headquarters, 1600 Rhode Island Avenue, N. W., Washington, D. C., by July 30. Advance entry must be made in order to pass the opportunity to fire down the line to other shooters who can make the trip if top-place winners cannot attend. Entries will be acknowledged and shooters will be notified whether their entry can be accepted or not. Make entry as early as possible but in no case later than July 30th as stated on card. At regionals fired during August, entries for the National Championship will be required as soon as the regional championship has been completed. Shooters who plan to compete in regionals during August are cautioned to be prepared to make entry at that Regional for National Matches, if eligible. Competitors will not be classified for awarding prizes.

The tentative firing schedule at Camp Dodge is:

Friday, September 2—Practice.

Saturday, September 3—Metallic sight, 40-shot matches at 50 yards, 50 meters, 100 yards and over the Dewar Course.

Sunday, September 4—Any sight, 40-shot matches at 50 yards, 50 meters, 100 yards and over the Dewar Course.

Monday, September 5—International Team Tryouts.

Tuesday, September 6—International Team Tryouts.

NATIONAL PISTOL CHAMPIONSHIPS

As announced last month, the 1949 National Pistol Championship will be fired at the Fort Sheridan (Illinois) range north of Chicago over Labor Day. Eligibility will be governed by the conditions as stated in the June RIFLEMAN, with the following change in team regulations:

Pistol Team membership, Paragraph (b)—Not more than one alternate may be named for each team provided such alternate has established his eligibility for the 1949 National Championships through individual or team competition in a regional tournament. All team members must comply with the usual team eligibility rules as to organization membership, etc.

The foregoing will provide a way for teams to compete in the NRA National Team Matches even though one of the regional team members may not be able to attend the Nationals.

Competitors are cautioned that entries in the National Pistol Championships must be made before July 30. The entry card received at the regional must be completed and mailed to NRA Headquarters, 1600 Rhode Island Avenue, N. W., Washington, D. C. by July 30th, or earlier if desired. This is necessary to allow competitors who finish below the top twenty percent in their regional aggregate to compete in the Nationals if they wish and if top-place winners cannot attend. Entries will be acknowledged and shooters will be notified whether each entry can be accepted or not. At regionals fired during August entries for the National Championships will be required at that regional as soon as the regional championship has been completed. Shooters in regionals during August are cautioned to come prepared to make entry if eligible. Competitors will not be classified for awarding prizes.

Pistol shooters will be glad to learn that the National Board for the Promotion of Rifle Practice may authorize the holding of the National Pistol Trophy Individual and Team Matches immediately following the NRA matches at Fort Sheridan. No final word is available at time of writing because the Military Establishment Budget has not been finally approved. If authorized, the National Individual and Team Matches probably will be scheduled for Monday, September 5th, in which case the International Team Tryouts will be advanced to Tuesday, September 6th.

The tentative schedule for the Pistol Championship is:

Thursday, September 1—Practice.

Friday, September 2—Individual .22 caliber, slow, timed, rapid, National Match Course and team National Match Course events.

Saturday, September 3—Individual center fire, slow, timed, rapid, National Match Course and team National Match Course events.

Sunday, September 4—Individual .45 caliber, slow, timed, rapid, National Match Course and team National Match Course events.

Monday, September 5—International Team Tryouts or (if authorized) National Individual and Team Matches.

Tuesday, September 6—If not fired Monday, the International Team Tryouts will be fired on this day. ◆ ◆ ◆

YOU DON'T BUY ACCURACY

(Continued from page 37)

Table 11	*Extreme Horizontal*	*Extreme Vertical*
Target 34	1.54 inch	.83 inch
Target 35	1.30 inch	1.30 inch
Target 36	.67 inch	.98 inch
Target 37	1.18 inch	2.08 inch
Average horizontal spread 40 shots		1.17 inch
Average vertical spread 40 shots		1.32 inch

The targets are good examples of relatively tight groups with very pronounced flyers. Note particularly that there are three nines out of the forty shots, with 30 shots in or touching the X-ring. The targets have no similarity to targets 5, 6, 7 and 8, which are the targets shot with the barrel in what we considered a neutral position with the barrel band. This is logical because the neutral position with the electric bedding device places no strain or tension on the barrel.

The barrel band was taken up a total of eight clicks and the next group of targets fired without a change in sight adjustment. Table 12 is the tabulated result.

Table 12	*Extreme Horizontal*	*Extreme Vertical*
Target 38	.90 inch	.98 inch
Target 39	1.06 inch	.87 inch
Target 40	1.10 inch	.55 inch
Target 41	.75 inch	.98 inch
Average horizontal spread 40 shots		.915 inch
Average vertical spread 40 shots		.815 inch

The groups on four consecutive targets average less than an inch in size but the large number of flyers shown in Table 13 is indicative of non-symmetrical groups.

Table 13	*Shots in X-Ring*	*Shots Touching Outside X-Ring*	*Flyers*
Target 38	5	2	3
Target 39	5	2	3
Target 40	9	0	1
Target 41	4	2	4
Total	23	6	11

It was decided to take another five clicks up, making a total of thirteen clicks of upward tension on the barrel, and four more targets were fired. The sight elevation had to be lowered four clicks to move the center of the group over the X-ring and targets 42, 43, 44 and 45 (Fig. 11) are the results. Table 14 is a tabulation of the extreme spreads.

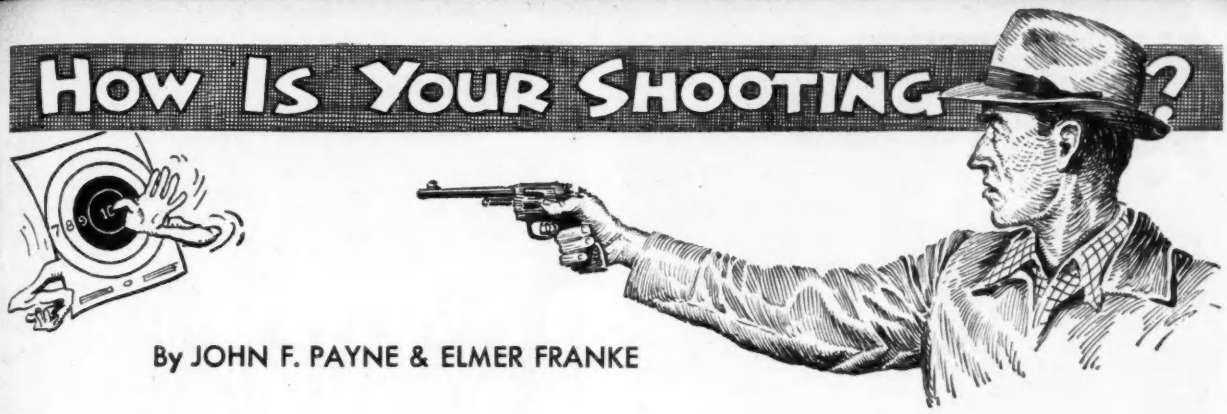
Table 14	*Extreme Horizontal*	*Extreme Vertical*
Target 42	.90 inch	.83 inch
Target 43	.90 inch	.79 inch
Target 44	.79 inch	.87 inch
Target 45	.67 inch	.98 inch
Average horizontal spread 40 shots		.777 inch
Average vertical spread 40 shots		.865 inch

It can be seen from Fig. 12 that there are only four shots not in or cutting the X-ring and these four touch the outside of the X-ring. At last groups were smaller than the size we had set as our goal when we started, so we decided to let well enough alone.

During the past four months we have deliberately left the barrel completely free for periods of a week at a time and then gone back to the thirteen-click adjustment, which has always reproduced group size and shape exactly.

If we have seemed critical of our 52, our apologies to Winchester. We now own two 52's, which probably came about from feeling that something good can always be improved. ◆ ◆ ◆

How Is Your Shooting?



By JOHN F. PAYNE & ELMER FRANKE

WHY DO SHOOTERS decide that they are not shooting as well this season as last? Ask one and he will answer, "Well, last year, in a match against Whosis Revolver Club, I was high man on the team with a 280. Last week we shot against the Whatsis Rifle and Pistol team and I was low with a 265. My rapid fire has gone all to h...."

This may or may not be true. Suppose it is. Last year our hypothetical shooter did shoot a 280 in a match, but how about that 260 he shot the night before, when shooting with Bill to see who would buy hamburgers at the local beanery? Also, this year, how about that 285 he shot to beat Charlie?

How about mathematical averages? They are all right but may lead to false conclusions if not handled correctly

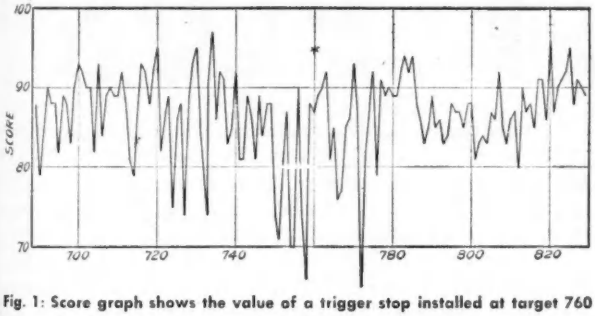


Fig. 1: Score graph shows the value of a trigger stop installed at target 760

and interpreted carefully. For instance, take any group of scores, say those from July 1 to July 31. Suppose that during that period the following ten slow-fire scores were fired: 75-88-91-87-90-86-88-85-89-84, for an average of 86.3. Not bad, but suppose we choose the period from July 2 until August 1. This eliminates one score of 75 and adds a score of, say, 86. Now, the average of the ten scores is 87.4, a gain of 1.1 points by changing the grouping of scores to be averaged. These averages are mathematically correct but they do not show the over-all picture, nor do they give the information necessary to determine one's rate of improvement.

Nothing will show the degree of consistency of one's shooting more clearly than a graphic system of keeping score. Such a record is easy to keep, gives more comprehensive results, and does not require an adding machine to operate.

We use graph paper ruled into 1/10-inch squares, a vertical scale of 1 inch equals 10 points and a horizontal scale of 1 inch equals 20 targets. A separate graph is plotted for slow, timed and rapid fire. A separate graph for any other course of fire can be kept if desired.

Along the left hand vertical side even scores of 70, 80, 90, and 100 are marked. Along the bottom each twentieth target is marked. Here, also, can be noted dates or major points of interest, such as a new barrel, new sights, or any other change, the effect of which is desired for comparison with previous performances.

Figure 1 gives the procedure for determining the value of changes in equipment. The graph up to target number 760 (marked with an asterisk) represents rapid-fire scores fired with the Colt Officer's Model 'as issued', with the exception of custom grips installed before this system was used.

At target 760 a trigger stop was installed in hopes of reducing the number of shots going into the white, low and left.

It will be noted that little improvement is shown, except for the first three or four targets (those fired while the gun was a stranger), until sixteen or seventeen scores had been fired. From then on, the value of the trigger stop is obvious from the graph. A steady climb in score, as well as more consistent results, is evident.

Figure 2 graphs three groups of twenty targets taken from slow-fire records. Section A shows scores fired in midsummer 1946, section B shows scores fired about the same time in 1947, and section C is a graph of recent practice scores fired the summer of 1948. Even though no improvement had been claimed by the shooter, these graphs show otherwise. Note that section B shows more consistent shooting than does section A, although section A's mathematical average is two-tenths of a point higher than section B (section A average=84.2 and section B average=84.0). Note, too, that section B shows a general trend downward. This was the

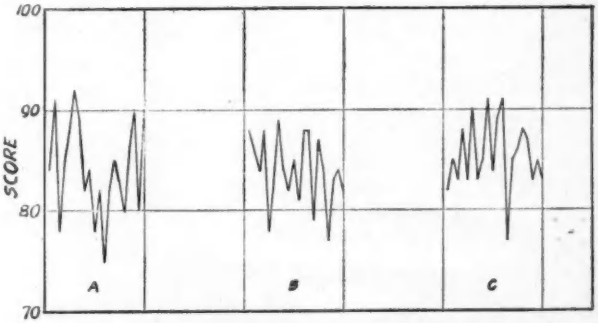


Fig. 2: Comparison of three groups of slow-fire scores show consistent shooting with a downward trend in group B, but group C shows improvement

beginning of a cyclic slump. Section C shows an upward trend, more consistent scores and fewer erratic targets.

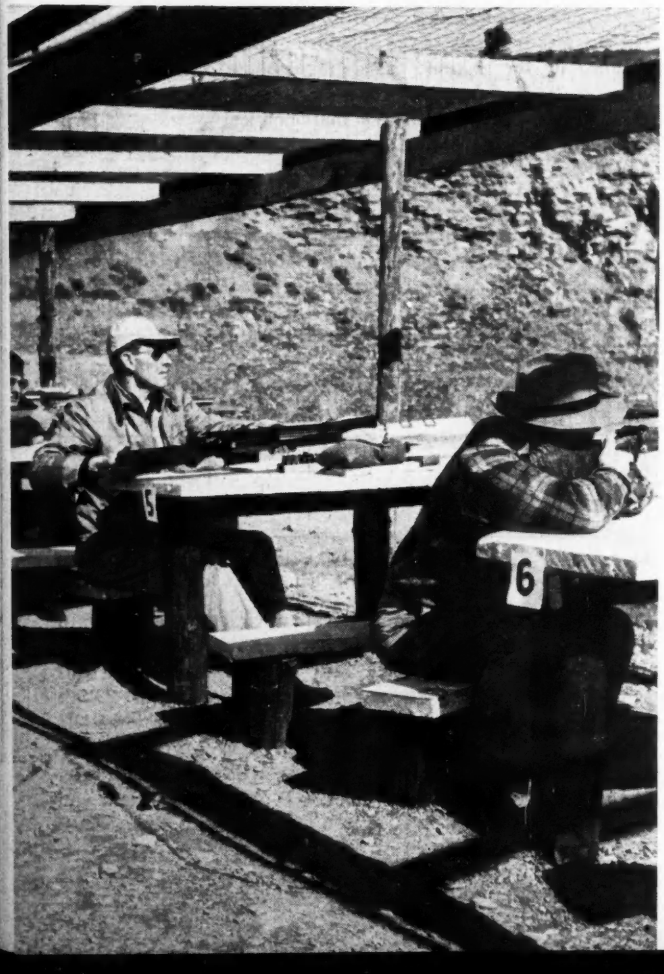
One important thing to be kept in mind when using this system is—be absolutely honest in plotting scores fired. Don't forget to plot that 75 you made when you had the jerks. It looks sad to plot such a score, but it's very gratifying to look over the graph and see such blowups becoming rare.

Incidentally, how *is* your shooting? Plot a graph and you can see for yourself. ◆ ◆ ◆

Trunk of auto made excellent reloading shop for Frederick W. Beckert, of Pittsburgh, who loaded cartridges with tools set up on bumper of his car

Rifles used in matches were bull guns. Majority were chambered for .219 Wasp, though .220 Swift and Improved Swift won several events

ACCURACY PLUS



Five shots at 100 yards measuring .17-inch center-to-center of the widest holes, five shots at 200 yards in .565-inch, and five shots at 300 meters in 1.3125-inches were the winning groups fired at the 1949 annual match of the Bench Rest Shooters Association at Du Bois, Penna., on May 28, 29 & 30.

Firing from solid wooden benches like those pictured at left, the shooters used a variety of super-accurate rifles, the .219 Wasp being the most common. However, matches were won with other calibers to prove that the Wasp is not supreme in the class of rifles which will fire extremely small groups. NRA's M. D. Waite placed second in the 200-yard aggregate using an Improved Swift and Sierra custom bullets, his ten groups averaging 1.442 inches. One 300-meter match was taken by D. E. Barr with a 1.937-inch group using a .220 Swift. W. B. Curtis, firing a .22 Varminter and using 8S bullets, won an individual match at 100 yards with a five-shot group which measured .276 inch, to afford further proof that the statement cannot be made that one caliber rifle is always more accurate than another. Too, there are other factors involved in accuracy.

There was a time when shooters who wanted exceptional accuracy always made the bullets they used, but the excellent commercial bullets available today are gradually replacing the hand-made projectiles. At Du Bois the Sierra bullets made by Harris Machine Co., 312 E. Bermudez, Riveria, Calif., were used by a large percentage of shooters. R. K. Nelson, 200-yard aggregate winner with 1.299-inch average group measurement, used Sierra bullets; so did Al Marciante, who won second place in the 100-yard aggregate with a .550-inch group

Remington's Merle Walker (left) and shooting partner Cottar (center) prepare to fire. Man at right illustrates standard bench-rest position

Starret gauge on machined steel base was used to measure groups to one thousandth of inch. Al Hoyer's 300-meter group measured 1.312 inch

Old-timer Marcy Prescott was photographed seating bullet with a hammer. Head of bullet seater was battered round like end of chisel handle

average, two 100-yard individual matches, and one of the five 300-meter matches. First place winner in the 100-yard aggregate, M. H. Walker, did use his own bullets, however.

The shooters who attended the match are a peculiar breed. Most of us are satisfied with minute of angle accuracy, but such shooting is looked down upon by the bench-rest addict who asks for and gets half-minute of angle accuracy or better. 'One-hole' groups at 100 yards are fairly common, and judging by reports one-hole groups at 200 yards will be common in the near future. It was surprising to note that many of the riflemen were gunsmiths taking a busman's holiday. Also present in considerable numbers were specialists in stockmaking, bullet diemaking, chamber reamer manufacturers, scope sight manufacturers, and wildcat cartridge experimenters. A spirit of cooperation among nearly every person attending the match was evidenced by a free interchange of advice, bullets, powder and loading tools, which is a far cry from Perry where competitors used rubber bands to conceal the rear-sight windage index when they came off the 600- and 1000-yard firing lines.

Du Bois was chosen as the site for the first 1949 match at the time of the Bench Rest Shooters Convention held during 1948 at Johnstown, New York. After receipt of official sanction from the Association, the DuBois Rifle and Pistol Club under J. J. Benyon, Secretary, immediately began work on their range, and in the short time of three months had constructed twelve solid shooting benches, a club house, an indoor rifle range, and a statistical office. The club has facilities for both small-bore and big-bore matches and the range itself will accommodate targets up to and including 600 yards.

Under the award system used at Du Bois, there were three money winners, based on group size, score and closest centershot, for each match. First and second place aggregate prizes based on group sizes were also awarded for each stage. All of the entry fees, less fifteen percent deducted for operating expenses, were returned to the shooters in the form of awards.

The statistical section was of particular interest due to the peculiarities of the bench-rest game wherein a match can be won or lost by a discrepancy of a thousandth of an inch. Such close, rapid measurements were made possible by a unique scoring device consisting of a Starrett dial indicator mounted on a machined steel base plate. A tightly-fitting movable plug was inserted in one shot hole and a fixed plug was inserted in another. By opposing the plugs against the plunger of the dial indicator, it was possible to measure the distance between the centers of any two shot holes within the capacity of the dial indicator. Large groups were measured with calipers and an accurate engine-divided rule. There is no reason why the dial-indicator device could not be designed to measure any group within reason. The only requirement would be a longer base to permit movement of the fixed plug from one gradation to another. Scoring was so accurately accomplished that no protests were heard from the shooters. Due to lack of help, a match bulletin could not be published after each match although the target frames were displayed for five minutes.

The target frames themselves were of particular interest since their design facilitated rapid conduct of the matches. Each frame, covered with composition board, held ten record and ten sighting targets mounted with the record target above the sighter. These master frames were fitted with clips so that they could be readily hung onto the fixed horizontal stringers made from ordinary gas pipe mounted upon sturdy 4x4-inch uprights. The metal target numbers were movable to permit ready placement of the numbers under the proper target after the new frame had been hung. The target frames sufficed for a complete match of over fifty shooters, after which they were changed by a truck detail.

All in all, the bench-rest game promises to become a sport of major interest during the years to come—appealing as it does to shooters both young and old. It is true that the equipment is a bit expensive, but not much more than that required for pursuance of the .22-caliber small-bore game. The few basic rules and restrictions free the bench-rest game from nearly all of the bickering and myriads of restrictions common to small-bore shooting. The credo of bench-rest shooting is to let the best man win, asking only that he doesn't use a machine rest in the process. ◆ ◆ ◆

WHAT MAKES A PISTOL CHAMPION?

(Continued from page 17)

One shooter used sights 0.150-inches width.

Eleven of the shooters used factory guns with no special gunsmithing, and twenty-four had special work on their .22's. Of the twenty-four, eight had home gunsmithing done on them, ten had Berdon jobs, two by Buchanan, two by King and one each by Cline and Peters.

A report on the center-fire guns shows a total of forty-five owned by the group, approximately 1.3 guns per man. Of the forty-five only two are .32 caliber. The rest are all Colt Officers' Models .38 Special with the exception of one S&W Magnum and two S&W K .38's. The average age of the guns is 7.1 years (compared with 5.3 years for .22's). Two guns were equipped with special barrels (Buchanan). Almost half had some form of trigger stop and only five were equipped with trigger shoes.

Thirty-one shooters gave information concerning stocks on the center-fire guns. Of these, four used factory stocks 'as issued', ten had Sanderson custom grips, nine had homemade grips, three used Roper grips, three used factory grips with adaptors, and two used 'custom' grips.

Thirty-one shooters furnished information on sights. Of these, twelve specified they used Roper sights, twelve use King, and seven use factory sights. The width preferred was one-eighth inch by twenty-two, one-tenth inch by seven, and three thirty-seconds by two.

Only two reported weighting their center fires. One reported weight in butt, and one in butt and under barrel at muzzle. Details of amount used were not given.

Thirty answered the question on short actions and of these, twenty stated they used short actions, as follows: Conversion by Buchanan—six, by Berdon—six, by King—four, by Peters—two, by Harpe—one, and, believe it or not, homemade—one.

Thirty-one replies on gunsmithing were received on the center-fire guns as follows: No special gunsmithing—one, by Berdon—ten, by Buchanan—seven, homemade jobs—five, by King—four, by Harpe—one, and others—three.

Now, lastly, for some data on the .45 guns. The shooters own forty-seven .45's or about 1.3 per shooter. All are Colt's Automatic pistols. Only three are National Match Models, and the average age of all is 8.3 years. Many reported guns over fifteen years old and one shooter reported one venerable old-timer thirty years old. Eight had trigger stops, twelve were arched housing models, and sixteen had long triggers.

As for stocks, twenty-six shooters reported as follows: Eight—factory stocks, eighteen—custom stocks, of which eight were Sanderson, seven homemade, two Roper, and one King.

No digestible information was given on sights because too few reported. However, most of those that did report use fixed sights of varied makes and of one-eighth inch width.

The reports indicated a larger proportion of gunsmithing on the .45's than on either of the other two calibers. Of thirty-four returns, one indicated no special gunsmithing, four had homemade jobs, twelve had Berdon work, five by Buchanan, five by Harpe, three by King, and four by others.

What have we learned from our efforts? Well, I believe we have proven that the top-flighters are a more or less average, ordinary group physically, using equipment and methods that are familiar and accessible to all of us. They have many years experience in a tough sport which has gradually hardened them to the attacks of 'buck'. They have a lot of matches under their belt, and they've stayed with the game a long time—probably because they succeeded in reaching the top reasonably early in their careers. ♦ ♦ ♦

THE BULLET'S FLIGHT

(Continued from page 13)

K versus velocity. The curve will have a shape similar to that shown in Fig. 2.

The velocity of sound varies with temperature. However, the curve in Fig. 2 remains the same if we plot **K** against the ratio of **V** to the speed of sound, or $\frac{V}{V_s}$. **K** is always plotted in this manner. The ratio $\frac{V}{V_s}$ is called Mach's Number by physicists and is designated **M**. It would seem offhand, from the curve of Fig. 2, that the drag force would decrease above the velocity of sound. There is no such luck, however, since **K** decreases at a slower rate than the increase due to the velocity squared in the drag equation. However, the rate of increase in retardation with an increase in velocity is greater, just below the velocity of sound, than at higher velocities. Of course, the actual amount of retardation increases as the velocity increases. The shape of the drag (or retardation) curve with velocity varies directly as **K** varies, such as shown in Fig. 3. To illustrate, the dotted line curve represents the shape if **K** were constant with velocity and equal to the low speed value of **K** on Fig. 2.

Now let us compare the **K** value of some typical bullets. The reader should search out data on drag coefficients **(K)** for various bullets for actual application and study since we are concerned here mainly with the basic physics of the trajectory problem. However, Fig. 2 compares some basic bullets. Since **K** is a shape coefficient, the magnitude of **K** at any velocity will depend on the shape of the bullet.

The three curves on Fig. 2 represent **K** values for three different bullets. The nose radius of all three is .36 caliber, while the ogival (side of the nose) radius is 2, 3 and 6.0 calibers. All three bullets are flat base. Although boattail bullets are not shown, they will have slightly lower **K** values than square-base bullets.

We can now study the actual construction of trajectories. As an example, we will use the bullet of 6.0 calibers radius. We will use bullets having sectional densities of 1500, 2000 and 2500 grains per square inch. This covers practically all small arms, but the idea here is to get the reader to construct his own curves, too, in order to understand fundamentals. The sectional density is the bullet weight in grains divided by the cross-sectional area in square inches, $\frac{W}{A}$. The section area of a bullet is quickly found by multiplying the square of the true caliber by .7854.

The retardation for sectional densities can be plotted from the equation previously derived, as shown by Fig. 4. For any velocity, we can take from Fig. 4 the retardation due to air resistance.

In Part II, to be published next month, we will show the actual manner in which the velocity loss and trajectory are calculated for specific cases. ♦ ♦ ♦

THE OLD COACH'S PAGE

When the beginner starts shooting he is inclined to accept the rifle as it is handed to him. Only after he has become grounded in the fundamentals of target shooting, and reaches a level of performance which he seems unable to rise above, is there any likelihood that he will look at the rifle critically and begin to experiment with sling tension, bedding and gadgets. Attention given to iron sights may lead to an increase in score.

NOW YOU SEE IT, NOW YOU DON'T

HOW MANY TIMES have you noticed a sight picture blur out and become fuzzy when shooting iron sights? Whose fault is it? Many shooters blame blurring on their eyes and think that they are slowly going blind. In an unusual case that may be, but in most cases a blurred sight picture is the result of a maladjusted sight combination.

The proper size apertures to use in both the front and rear sights are the primary consideration when selecting usable sight combinations. The standard targets used today appear about the same size to the eye when looking through the sights. Thus one front aperture may be used for all ranges in the standard American courses of fire. The size of the rear sight aperture disc will vary with the prevailing conditions of the range. When the sun is beating down on a hot day and there is a lot of light reflection on the target, you will usually find that the size of the rear aperture will have to be cut down as the eye is getting more light than it can handle. The opposite is true on dark or extremely cloudy days and you will find that you have to enlarge the size of your rear aperture in order to admit enough light to enable your eye to resolve the bull correctly. This is not the only factor in sight picture, however it is one of the most important. Make sure of your aperture sizes and you will be well on your way to better iron sight scores.

There have always been a great many shooters without 20-20 vision who believe that their eyes cause bad iron sight scores. In some cases this may be true, but what shooters don't realize is that they can have special adaptors made for their rear sight disc. There are several such adaptors on the market at the present time which will enable the shooters to put a correction lens in the disc to correct faulty vision. The procedure is allowed in the NRA rules so you don't have to worry about the legality of it.

In iron sight shooting, holding and sight picture are both imperative to good scores. Coordination is also a prime factor when holding is not what it should be. When the conditions are rough and you need to get a shot off fast, then your eye-finger coordination is most important. In iron sight shooting the most important fact to realize is that wind condition is actually more important than your sight picture. Wind will always move the bullet farther out of the ten-ring than a slight off-center hold will. This fact may be illustrated very well by actually shooting an average of seven or eight shots a minute on an indoor range and then noting your score. Then on an outdoor range when the conditions are a little rough, try holding well and shooting deliberately. Note your score and then try shooting the same number of shots at the same rate as you did indoors. You will most likely find your scores improving. You will also be able to keep tab on the wind and get more shots off faster while the conditions are the same. Then, if conditions change, you will have the advantage of having fired more shots while conditions were the same. If you go out for a wide one because of conditions, you may rest assured that you've got plenty of company.

On the other hand, when conditions are perfect and the light is good, there is no sense in shooting very fast. Under these conditions shoot any way you wish. However, there's one warning which should be mentioned in connection with long holds. If you are in the habit of shooting slow and holding your sight picture for a long interval of time, and you are not too pleased with results, you may have fallen victim to your own carefulness. Your eye is probably the reason but you may not realize it. Every competitive shooter has heard over a thousand times the old alibi about a perfect sight picture and bad shot, and nobody seems to realize the cause. The cause is really very simple, it's just a matter of the eye looking for the perfect sight picture. After looking for a time, you eventually see the sight picture clearly and let fly. It's the same principle as the old card trick where a person focuses his eyes on a black object on white paper for a few seconds and then looks into the sky and sees the image of the object against the sky. Actually your eye does the same thing to your sight picture and you see what you want to see when it is actually not there. Don't be a sucker and fall for the false image stuff. You will do just as well by getting your shot off as soon as you can. Also, it's not so tiring.

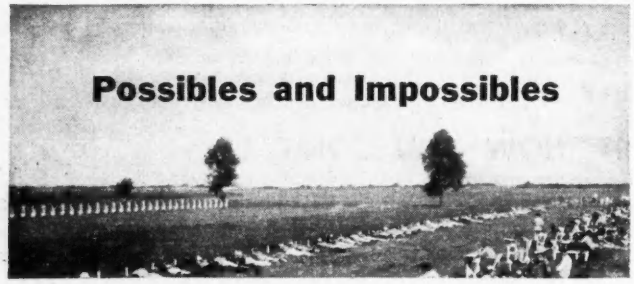
Another thing, watch out when you start to hold off with iron sights. That's a very hard thing to do. The sight adjustments on a target sight are far more accurate than your judgment can ever be regarding an iron sight hold off. You may be lucky enough to get some of your shots in by holding for wind, but if you can guess so accurately as to the effect of the wind on the bullet, then you can put the shot in the middle by clicking the sight over the exact amount. The main reason that a person holds off to one side or another with iron sights is that he is not sure of the wind and is in reality taking a chance. However, don't let me lead you to believe that a person can't shoot good scores by holding over because he can. The hold-over method takes a great deal of practice.

The information given here applies to indoor shooting as well as outdoor shooting. Don't try to make the sight picture letter perfect because you are apt to be fooled. With a little practice and experimentation with the sight picture you will be well on your way to better scores. If you have an effective system of sighting that is your own, then don't change to something else but stick to it. ♦ ♦ ♦

A PAPER FOR PEOPLE WHO SHOOT

Rifle Re

VOL. 12, NO. 7 BRIDGEP , JUL



In our travels around the country, many discussions have been heard regarding a firing point. Having been asked our frank opinion on several occasions as to the type of firing point we consider most desirable, here's our equally frank answer.

A black top or concrete firing line with covered firing point gets our vote every time—well, almost every time.

Of course, there are many places in the country where rain is infrequent and drainage no problem. In such places a sod or packed-dirt firing line is certainly not objectionable. But, generally speaking, drainage *is* a problem, and we believe best drainage can be obtained with a black top or concrete firing line. Then there's the argument of sore elbows, but now-a-days most shooters use a soft shooting mat which we believe eliminates the sore elbow complex. We understand that the large ranges in England have had concrete firing lines for years.

Rain or shine, a covered firing point adds that final touch of *comfort* to match rifle shooting. When it's raining, the covered firing point is a great big umbrella which keeps the shooters dry while they continue firing. And it serves as an awning where it's pleasant to lie in the shade when the sun is hot—and maybe cuss that mirage a little.

* * *

A few days ago a letter arrived from an old friend and enthusiastic rifle shooter who was transferred recently to a big industrial plant in the southwest. Discovering that they had no rifle club, he decided to swing into action. "Since last writing you, a bulldozer with a winch (plus some rifle club members) has moved in on that range site and just about chewed out the rough opening . . . pulling over large trees with the winch, and plowing along with the blade to move the underbrush. We have a skilled company operator to do the work on the dozer. At times he is lost from sight in the tangle, but a wall of green underbrush and small trees just keeps moving along toward the edge of the bayou. It's a lot of fun working with one of them."

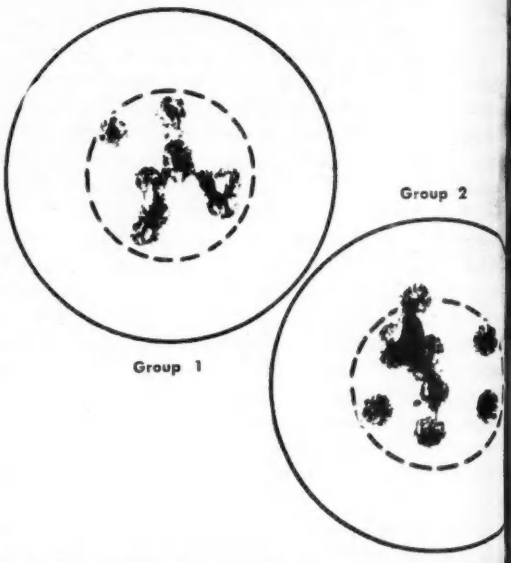
By the time this issue of the "Rifleman" hits the press, their range should be completed. They plan to give basic training in rifle marksmanship to new members and, incidently, they already have 68 members.

Three large clubs in their vicinity have volunteered to assist them. After the training period is completed, these clubs will bring over their equipment and team up with members of the new club in two-man team matches. This will teach the new group some of the fine points of rifle shooting. We wonder if there aren't other industrial plants with new rifle clubs that would appreciate having the well-established clubs in their vicinity teach their new members the fundamentals of precision rifle shooting.

* * *

Needless to say, it was disappointing to read the announcement in the May "Rifleman" regarding the 1949 Nationals. Most of us still had hopes that the new Congress would make funds available for an old-time Camp Perry. But things are changing so let's bear down and get behind the Regionals and the National Small Bore Championships. The latter is scheduled to be held at Camp Dodge in Des Moines, Iowa, on September 1 through 5. And, incidentally, we hear that the Camp Dodge site is going to work out all right and will be a better set-up than last year.

SHOOTING FU
SUMMER



AROUND OUR CLUB . . . "LOVE that Am

JOE KISSES EVERY BULLET
AND HE KISSES EVERY EMPTY CARTRIDGE CA TOO
IT'S NO WONDER!... WITH THE SCORES HE'S BEEN MAKING WITH PALMA KLEANBORE AND TARGETMASTER AMMO!

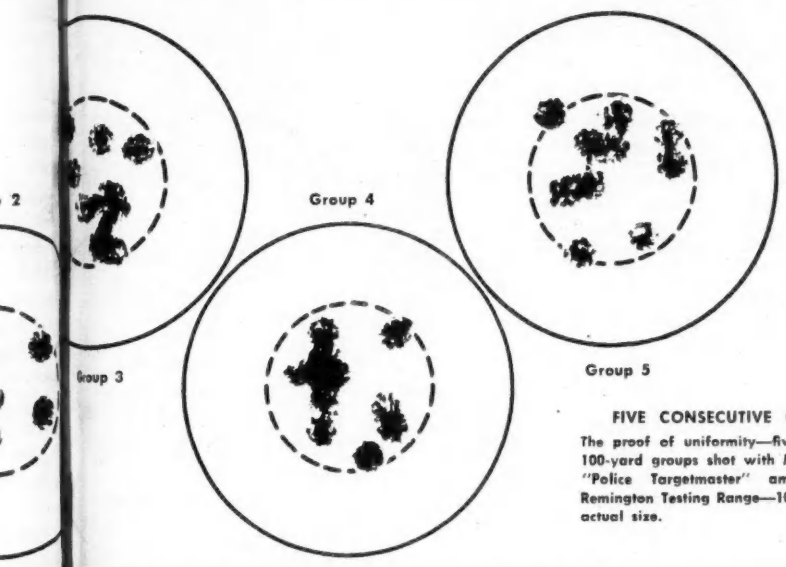
"Rangemaster," "Palma," "Kleanbore" and "Targetmaster" are Pat. Off. by Remington Arms Company, Inc., Bridgeport 2,

Remington News

WEATHER:
LIKE A REGIONAL CHAMP — PRETTY HOT

RIDGEPO[RT], JULY, 1949

FUND HOT GROUPS FEATURE ERSON FROM COAST TO COAST



FIVE CONSECUTIVE GROUPS

The proof of uniformity—five consecutive 100-yard groups shot with Model 37 and "Police Targetmaster" ammunition on Remington Testing Range—10 shot groups, actual size.

Torrid Groups Observed with Remington Model 37 and Match Ammunition

Bridgeport, Conn., July, 1949. It makes no difference whether we're basking in the Texas sun or feeling cool New England breezes. Wherever we travel, there are always a couple of red hot groups brought out and proudly displayed. Everyone seems to be getting a tremendous wallop out of just being "alive and shootin'," as one old timer put it. Such enthusiasm, coupled with the excellence of the Regional competition, makes this one of the most successful and pleasant summers ever spent 'round the circuit.

No small portion of the torrid groups observed have been shot with Remington Model 37 "Rangemasters" and Remington match ammunition. Seems the boys are still buzzin' about that "Miracle Trigger" on the Model 37, marvelling at its clean, crisp let-off with no backlash or creep.

Many good words are heard, too, about Remington match

ammo — "Palma Kleanbore" and "Police Targetmaster." As usual, shooters rely on this highly consistent ammo to help them shoot more consecutive groups like those shown above. From experience, these "hot shots" are confident that Remington ammo will back up their skill . . . help them shoot consistently tight groups.

Remington "Licks" Your Bullets and "Mikes" the Rim to Assure Accuracy

[It]'s pretty hard to change [shoo]ter's habits. And, if he [has] some of the things he [does] will bring good luck and [bad] shooting, well—then more [pow]r to him.

[For] example, there was a [time] when shooters moistened [their] with their tongues to [increa]se the lubrication. Other [shoo]ters could be seen measuring [the] rim with a micrometer [to] be sure it was uniform in [thick]ness.

[Cust]oms like these have a [way] of hanging on. But actually there's no need for bullet-licking or rim-miking when [you] shoot Remington ammunition. For Remington ballistics experts are right on their toes, checking and rechecking to assure the very finest in uniform, consistent performance. Before your Remington "Palma Kleanbore" and "Police Targetmaster" ammo ever leaves the factory, test samples are submitted to rigid "torture tests"—each component part gets a thorough going over. That's why you can be absolutely sure of ballistic perfection . . . why shooters count on Remington match ammunition to deliver with the greatest possible consistency. From nose to rim, they've got what it takes to back up your shooting ability to the utmost. "If It's Remington—It's Right!"

Remington Ammo Gets Preview of Accuracy

In the photo above is a micro projector. On its screen is a highly magnified shadow of a 22 cartridge case.

This test gives an accurate, visual micrometer check of critical dimensions—helps assure hair-line accuracy. It's one of the many tests constantly under way in the Remington ballistic labs—to assure the shooter the match accuracy and uniformity he needs when the competition really gets hot.

THE SPOTTING SCOPE -- July 1949

It was North Bay, Ontario, for the annual convention of the Outdoor Writers of America last month . . . and contacts made indicate an enthusiasm on part of the members to give all-out assistance to shooters. . . . Partial list of delegates includes: OWAA President J. Hammond Brown (Baltimore) . . . Bob Wilson (Washington) . . . Don Gillies (Detroit) . . . Irving (Abe) Cohen (West Virginia) . . . V. B. Gray (Cleveland) . . . Lou Klewer (Toledo) . . . Nash Buckingham (Memphis) . . . Stewart Kennard (Baltimore) . . . Charles Gillham (Chicago) . . . Jim Miller (Utica) . . . Lou Williams (Chattanooga) . . . Jim Stueber (Ohio) . . . Perc Angwin (Vermont) . . . Ed Keenan (Burlington, Vt.) . . . Pete McGillen (Toronto) . . . Jack Van Coevering (Detroit) . . . total registration nearly 250 members.

Hospitality of the Canadians before, during and after convention business drew the warm praise of OWAA delegates . . . who will pound typewriters and give the land of a million lakes a million dollars in publicity . . . especially for the efforts of the Ontario Lands & Forests Division's Phil Rhynas and Mike Bates, of Metagama. . . . Best hunting story going the rounds of Empire Hotel headquarters scared off at least a few self-styled marksmen . . . as veteran guide Len Hughes told how rifle master Max Jensen, of Cleveland, missed his bear two years running. . . . First bruin downed during convention week fell to the marksmanship of veteran outdoor writer Jimmy Stueber, of Ohio, OWAA secretary.

Highlight of the confab was a paper prepared by NRA Executive Director C. B. Lister calling for "more statistics and less sentiment" . . . among sportsmen, game commissioners and specialists in the matter of conservation-inspired gun laws. . . . Declaring that most such proposed legislation is for the avowed purpose of reducing hunting accidents, Lister pointed out that few states have even attempted an analysis of accidents . . . and asked: "How can you pass a law that will correct a condition when you don't know what condition needs correction?". . . NRA clubs and members would do well to press for more cooperation with local outdoor writers . . . to assist them when possible and, in turn, gain valuable friends.

Chief of Police John M. Mulkern, of Portland, Me., proudly announces completion of its headquarters pistol range . . . "second to none throughout the East". . . . Old-timers of the .30-caliber National Match game will regret to learn of the death of 62-year-old Major General "Joe" Fegan, USMC Ret., on May 26, following an automobile accident at Carlsbad, Cal. . . . Cleverest writing job in a gun club publication must be credited to Metrogun . . . official publication of the Metropolitan (N.Y.) Rod and Gun Club. . . . To prevent extinction of Alaska's depleted herds of mountain sheep, the U. S. Fish and Wildlife Service prescribed a closed season for 1949-50 . . . and has begun an extensive program of wolf and coyote control. . . . Milwaukee's recent Scout-O-Rama, with a big rifle display, drew nearly 45,000 people. . . . Well-known Bob Brownell is the new gun editor of The Sporting Goods Dealer. . . . Note to West Coast handgun competitors: The San Francisco Police Monthly Pistol Match scheduled for August 21 has been cancelled to avoid confliction with the Regional at Bakersfield. Charleston (W. Va.) Daily Mail's Abe Cohen is one of the nation's most enthusiastic shooting supporters . . . covers five dailies, thirty-three weeklies, and five monthly papers . . . plus radio. . . . Vermont shooters and clubs have another staunch friend in Ed Keenan, of Burlington, who will welcome all possible assistance and cooperation in his paper's programs. . . . Regional competitors seeking entry in the Nationals must turn in entry cards at their regional match . . . and will be accepted proportionately up to limits of the Camp Dodge (small bore) and Fort Sheridan (pistol) ranges. . . . All entrants will be notified if accepted or rejected. . . . Members' meetings at Regionals are attracting favorable comment . . . and many good suggestions for competitions committees. . . . NRA's Executive Committee definitely has scheduled the 1950 Convention for the West Coast . . . though the city is not yet definite . . . Don't forget . . . 1949's is in Denver, October 17-21.

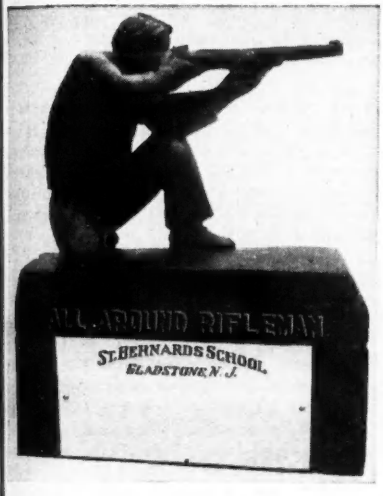
Ray Stann

UNIQUE JUNIOR TROPHY

The St. Bernard's School Junior Rifle Club, Gladstone, N. J., has a really special trophy awarded annually to the "All-Around Rifleman" in the club.

The trophy itself was hand-carved from solid walnut by Miss Elizabeth Forsythe of Irvington, N. J., who incidentally is a direct descendant of Rev. Alexander Forsythe, developer of the mercuric priming which made the modern cartridge possible.

Unique too is the plan of selecting the club member whose name is placed on the trophy. First the boy must shoot his qualification scores according to NRA requirements, second he must complete a twenty question written examination with a passing grade of 65



or better, last he must have the highest score for the school year on targets and examination combined.

Dedication plate on the trophy states "To the Memory of Washington's Riflemen who secured our Liberty in 1776 and all men who died in World Wars I and II to maintain these liberaties".

OLYMPIC PISTOL TARGETS

Plans are now available for the Olympic or International type rapid fire (bobber) pistol target frames. It is a simple inexpensive setup which may be added to existing range facilities.

Another new type of range plans now available for outdoor ranges are for novelty matches with mechanically operated "turkeys" and other types of swinging targets. They have been made from plans designed by the Boy Scouts of America.

Copies of these plans may be obtained by requesting them from N.R.A. Headquarters.

NEW PRELIMINARY BULLETIN SHEETS

The NRA is preparing new preliminary bulletin sheets to be used for posting scores fired in competition. Prepared on a box score basis it will eliminate the waiting of results by competitors and spectators while the regular preliminary bulletin is being prepared by the statistical office. The new bulletins will have spaces for five matches and will be laid out so that they may be over-lapped for any number of matches. Each sheet lists name, competitor number and classification of twenty-eight shooters.

The new preliminary sheet is being used as a fore-runner to the time when all registered tournaments will have a black-board preliminary bulletin. The whole step is being taken to stimulate spectator interest in the shooting sport.

All registered tournament sponsors are being forwarded a supply of the forms with instructions for their use. Additional forms will be sent upon request.

NEW ASSISTANT DCM

The U. S. Army could not have made a better choice than to appoint Col. Frank R. Lloyd to the post of Assistant DCM. A Camp Perry veteran of six seasons and holder of the Distinguished Medal for both rifle and pistol, Col. Lloyd brings to his position a thorough knowledge and understanding of the civilian shooter's problems. A graduate of the University of Iowa, he was commissioned in the United States Army in 1924. Since that time Col. Lloyd has been intensely interested in small arms and has fired with, captained and coached championship Infantry teams.

INSTRUCTION FILMS

Six films on service rifle marksmanship have been made available by the Department of the Army for club showing. These are 16MM and consist of a series titled "Rifle Marksmanship with the M1 Rifle". The six parts are:

TF 7-969 Print 1—Sighting and Aiming
TF 7-652 Print 2—Positions
TF 7-1094 Print 3—Trigger Squeeze
TF 7-1062 Print 4—Rapid Fire
TF 7-1100 Print 5—Elev. and Wind
TF 7-1101 Print 6—Zeroing and Use of Scorebook

The primary purpose of these films is to instruct service personnel. They are good entertainment and excellent M1 rifle instruction for any shooter. All or any part of the series can be obtained from the Headquarters of the Army Command in which you live. If you do not have the address phone the National Guard or a Reserve Officer. Address your film inquiry letter to the "Chief Signal Officer" of your Army Command Headquarters.

DCM NOTES

The processing of purchase requests for M1903, Caliber .30 (Springfield) unserviceable rifles is continuing as rapidly as rifles are made available for sale by the Ordnance Department. At the time of going to press, all orders received up to October 18th had been forwarded to arsenals. It is expected that all October requests for this rifle will eventually be filled.

Processing of purchase requests for M1917, Caliber .30 (Enfield) unserviceable rifles is awaiting the result of determination by the Ordnance Department as to further supply of such rifles in arsenals. Orders received up to October 5th have been processed, but the number of rifles remaining is not known at this time.

NRA Clubs requesting purchase of caliber .22 ammunition must state in their request that the ammunition is for the use of NRA members of the club only. Sales will not be made to individuals. New prices of caliber .22 ammunition is $71.70 per case of 10,000 rounds, plus packing and handling charge and excise tax of 11%.

TOURNAMENT SCHEDULES

Twenty-seven thousand copies of the 1949 Registered Tournament Schedule have been mailed to all competitors who have fired in registered competitions since January 1, 1949. The schedules are also available to other NRA members. A copy may be obtained by dropping a postcard to the NRA competitions section. The schedules list all registered rifle and pistol tournaments which were approved by the NRA prior to March 1, 1949. All tournaments registered after March 1 will not appear in the schedule. However, State and Regional championships will be carried in the Coming Events column of THE RIFLEMAN each month.

Below are listed some corrections to the printed schedule:

DELETE—

1. Pistol Tournament, August 21, 1949, at San Francisco, Calif.

CHANGES IN DATES—

1. Rifle Tourament (High Power) listed as August 20-21 at Camp Perry, Ohio, should be listed as August 13-14, same location.
2. State Smallbore Rifle will be fired at Camp Perry, Ohio, on August 20-21 instead of Mt. Gilead on July 16-17.
3. Tusco Rifle Tournament will be fired at New Philadelphia, Ohio on August 7 instead of 21.

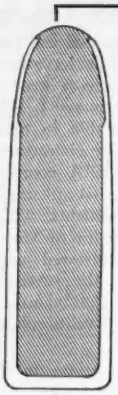
OTHER CORRECTIONS—

1. Pistol Tournament (Regional) listed for Dallas, Texas, on July 2-3-4 with Henry Hankey as the person to contact, should list Betty McPhee, 4018-B Travis, Dallas, Texas, instead of Mr. Hankey.
2. Pistol Tournament (Regional) at Davenport, Iowa, July 22-23-24. Substitute Carl Prevratil, 110 East Columbia, Apt. 2, Davenport, for Dr. J. G. Johnston.
3. The monthly pistol tournaments held at Los Angeles, Calif. on Aug. 7, Sept. 4, Oct. 2, Nov. 6 and Dec. 4 will not require advance entries.

JUNIOR DISTINGUISHED

Working their way through fifteen progressively more difficult qualification courses forty-one more boys and one girl were awarded NRA Distinguished Rifleman credentials during May. The listing below shows those accomplished young riflemen who turned in the forty targets required for this top rating.

Piers I. Lewis, St. Paul, Minn.
Fred Snow, Halliston, Mass.
Charles F. Olsen, Norfolk, Va.
Jack Brand, St. Louis, Mo.
Vaughan Wright, San Luis Obispo, Calif.
Sonya Joan Childs, Center Line, Mich.
Tom Towell, Madison, Wisc.
William Flynn, Cincinnati, Ohio
Sydney Cole, Dallas, Texas
Jack H. Channer, Batavia, Ohio
Robert Santee, Hillsboro, Ore.
Phillip Chisen, Denver, Colo.
John Shelter, Fork Union, Va.
Louis Keller, St. Louis, Mo.
Ronald I. Wolfson, Cleveland, Ohio
Daniel Melican, Alexandria, Va.
David Watkins, Knoxville, Tenn.
David A. Lanham, Lincoln Park, Mich.
Marvin Kaup, Nevada, Mo.
Robert D. Collins, East Alton, Ill.
Joe R. Koehler, Dayton, Ohio
George Butkovsky, Jr., Stamford, Conn.
Peter B. Webber, Portland, Me.
Luther R. Lloyd, Youngstown, Ohio
Ronald Peterson, Kane, Pa.
Fred Wessman, S. Williamsport, Pa.
Presley W. Kendall, Louisville, Ky.
Lowell Hall, Madison, Wisc.
Bob Davis, Des Moines, Iowa
Don G. Noyes, Zanesville, Ohio
Edwin E. Santee, Hillsboro, Ore.
Don Osborne, Denver, Colo.
Paul Boatwright, Fork Union, Va.
Carroll Williams, Fork Union, Va.
Thomas Diederich, St. Louis, Mo.
Joe Fuller, Balboa, Canal Zone
Earl Sowers, Knoxville, Tenn.
Jack Roper, Denver, Colo.
Robert Belknap, Nevada, Mo.
John C. Budicin, Arlington, Calif.
Donald H. Burgess, Proctor, Vt.
Edwin Geggken, Hollis, N. Y.



HORNADY BULLETS

Illustrated is the design of our 180 grain round nose, soft point .30 caliber bullet. The jackets are very heavy with the heavy portion carried well forward to insure deepest possible penetration. The nose is thin enough to expand readily. These bullets will conform to our rigid standard of uniformity in weight, form and finish.

Available now	per C
.270 caliber 130 grain Spire point	$4.50
.30 caliber 110 grain Spire point	4.25
.30 caliber 150 grain Spire point	4.50
.30 caliber 180 grain Spire point	4.75
.30 caliber 180 grain Round nose	4.75

Manufactured by **J. W. HORNADY**
324 West Fourth St. Grand Island, Nebraska

Give Your Gun HOPPE'S No. 9 PROTECTION

Use this solvent to remove all traces of primer, powder, lead and metal fouling and to prevent rust. Hoppe's No. 9 keeps guns like new. Ask your dealer or send us 10c for sample. Helpful "Gun Cleaning Guide" FREE upon request.

FRANK A. HOPPE, INC.
2321 No. 8th Street, Phila. 33, Pa.

NEW! ADJUSTABLE TRIGGER STOP

A SHOE, with a built-in adjustable trigger stop eliminates—excessive trigger movement in the most effective place. BEH'ND-THE-TRIGGER. Instantly attached, adjusted and locked with key furnished, available to fit the following automatic pistols. Hi-Standard 22 Colt, also 45 automatics that will take standard shoe.

$3.00 postpaid. State make and model.
ARTHUR T. GRAHN 2311 Humboldt Ave. Oakland 1, California

ARE YOUR GUNS WORTH $4.00 TO YOU?

SEE PAGE 96

"GUNBERTHS"

The very finest in Gun Cabinets and Gun Racks Made in both floor and wall models. Various sizes to meet every requirement. Finest workmanship with finest materials and beautifully finished.

← HANGING CORNER RACK

Send for illustrated price list on our full line of "Gunberths."

DEPT. R HAZLETON, PA.
Penn Taxidermy Studios

PEEP SIGHTS for KRAG RIFLES — $2.00. For Enfield $2.00; Mauser $4.50; Springfield $4.50; Jap $4.50. Krag Barrel Receiver Fillets, 65c. Fillets for Springfield, 65c. Springfield Sporter Butt Plates 70c. Grip Caps 40c. Satisfaction or money refunded. Canvas Gun Cases $2.75.

SPRING ADJUSTABLE BARREL BANDS for Krag, Enfield and other rifles. 75c each. Nut and 1¼" sling link, 50c. Screw and link for stock toe, 50c.
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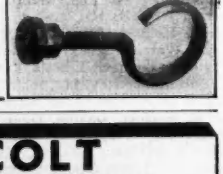

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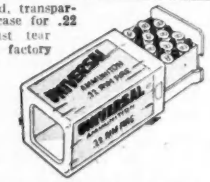

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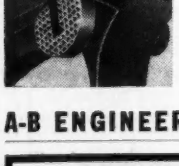

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Clubs and COMPETITORS

The St. Petersburg Police Department and the Sunshine Rifle and Pistol Club plan to operate a city-wide junior rifle marksmanship program this summer. Between six and seven hundred boys are expected to enroll during the sixty days the classes will be conducted.

☆ ☆ ☆

John Lenz, Director of Junior Activities for the Associated Gun Clubs of Baltimore, reports that with seven junior clubs firing a round robin match schedule, the Bal Mar Junior Rifle Club team ended on top with a clean record of six wins.

☆ ☆ ☆

Boy Scouts in the Denver area held a match on April 24th. Seven troop teams fired a prone-sitting match with high honors going to Troop 242 with 887. Top individual score went also to a member of that troop, Gordon Schindel. Troop 242 was high individual at 195.

☆ ☆ ☆

Forty-nine teams and 196 young riflemen made the 2nd Annual Junior Rifle Match sponsored by the Teaneck Rifle and Pistol Club, a huge success. Fired May 7th at Swiss Hall, Union City, New Jersey, the match called for 20 shots prone per shooter at 75 feet. Top team was the Glen Ridge Junior Riflemen with 777, second with 76[illegible] was the Swiss Junior Rifle Team, while the Perth Amboy Junior Club came in third with 765. Miss Audrey Bockmann, fired a perfect 200 for high individual honors. The 198 of Ernie Meyer and Robert Harlow took second and third places respectively.

☆ ☆ ☆

Reports continue to come in to the NRA periodically of confusion at rifle and pistol tournaments where *place* awards are given to the match winners and *class* awards to the high shooter in each classification.

Frequently the *place* winner is also the *class* winner and the question then arises, does he get both awards? If not, which one?

This matter is not covered in NRA rules but there is the precedent of long established custom. A shooter does not accept two awards in one match. The *place* award always takes precedence over any *class* award. In instances where a place award winner is also high in his classification the *class* award is passed down to the next highest competitor in the class. At NRA Registered Tournaments any procedure different from the above is required to be outlined in the tournament program. If no specific provision is made in the program the above procedure is understood.

☆ ☆ ☆

One hundred and sixty persons including the county sheriff and the city police chief attended the recent annual banquet of the Inter-City League at Anaheim, California.

Anaheim, a city of approximately eleven thousand, is one of the most shooting minded communities in the far southwest. Much of the enthusiasm is due to the hard work of Major Ralph E. Comstock, in charge of the California Cadet Corps at Anaheim Union

High School. Major Comstock has created, at this school, a junior rifle team that has beaten every cadet corps team from Santa Monica to the Mexican border and which boasts the highest individual score ever fired in a California cadet match.

COMING EVENTS

Regional Championship Tournaments (Class A) and State or Division Championships (Class B) only are listed below. All other N.R.A. Registered Tournaments are listed in a printed schedule that will be sent to any shooter upon request. Send your request by letter or penny postcard to the National Rifle Association, Competitions Section, 1600 Rhode Island Avenue, N. W., Washington 6, D. C.

Tournaments requiring advance entries are indicated by (Adv.). Tournaments limiting the number of entries that can be accepted are indicated by (Ltd.).

Always write to the tournament sponsor for a program in advance of any Registered Tournament you plan to attend. It is your assurance that you will know all of the details and the tournament conditions.

JULY

3-4 (A) NEW YORK—Regional Pistol Tournament at Poughkeepsie, New York. Mrs. Martha W. Strahan, 30 Arnold Boulevard, Poughkeepsie, New York (Adv-Ltd)

3-4 (B) WASHINGTON—Washington State High Power Tournament at Fort Lewis, Washington. C. M. Styer, 120 West Hudson Street, Seattle 4, Washington

3-4 (A) TEXAS—Regional Pistol Tournament at Dallas, Texas. Mrs. Betty McPhee, 4018-B Travis, Dallas, Texas (Adv-Ltd)

3-4 (A) MONTANA—Regional Small Bore Rifle Tournament at Anaconda, Montana. Fred J. Mesenko, Anaconda Rifle and Pistol Club, 700 Oak Street, Anaconda, Montana (Adv-Ltd)

3-4 (B) HAWAII—Territorial Pistol Championship at Honolulu, T. H. G. W. Premo, 2323-B Ala Wai, Honolulu, T. H.

3-4 (A) VIRGINIA—Regional Pistol Tournament at Quantico, Virginia. Lt. Col. William L. Crickett, Provost Marshall, MCS, Quantico, Virginia (Adv-Ltd)

4 (B) PENNSYLVANIA—State Small Bore Championship at Altoona. John E. Kaylor, 709 6th Avenue, Juniata, Altoona, Pennsylvania.

4 (B) NEW JERSEY—Sea Girt Small Bore Championships at Sea Girt, New Jersey. Charles Walter, 497 Cornell Street, Perth Amboy, New Jersey.

9 (A) INDIANA—Regional Small Bore Rifle Tournament at Bristol, Indiana. Garnette R. Turner, 135 South Scott Street, South Bend 2, Indiana (Adv-Ltd)

10 (B) OKLAHOMA—Oklahoma State .30 Caliber Rifle Championship at Claremore, Oklahoma. E. M. Fuller, 207 South Toledo, Tulsa, Oklahoma (Adv-Ltd)

10 (B) MARYLAND—Maryland State .30 Caliber Rifle Championship at Fort George G. Meade, Maryland. Earle S. Jones, Jr., 5036 Orville Avenue, Baltimore 5, Maryland.

10 (B) OREGON—Oregon State Small Bore Rifle Championship at LaGrande, Oregon. Herbert Miller, 2707 North 4th Street, LaGrande, Oregon (Adv-Ltd)

10 (A) COLORADO—Regional Pistol Tournament at Denver, Colorado. Lloyd Markle, 1006 Clive Street, Denver, Colorado (Adv-Ltd)

10 (B) WEST VIRGINIA—7th Annual Small Bore Rifle Tournament at Parkersburg, West Virginia. R. A. Simpson, Fort Boreman Rifle Club, Parkersburg, West Virginia.

10 (A) CONNECTICUT — Northeastern Regional Small Bore Rifle Tournament at Middlefield, Connecticut. J. Russell Lent, Middlefield, Connecticut (Adv-Ltd)

16 (B) TENNESSEE—Tennessee State Pistol Championship at Nashville, Tennessee. R. Thurmond Sykes, Hemlock Avenue, Nashville, Tennessee (Adv)

17 (B) OKLAHOMA—State Small Bore Rifle Championship at Tulsa, Oklahoma. E. M. Fuller 207 South Toledo, Tulsa, Oklahoma (Adv-Ltd)

17 (A) MONTANA—Regional Pistol Tournament at Anaconda, Montana. Oscar Landet, Anaconda Rifle and Pistol Club, Anaconda, Montana (Adv-Ltd)

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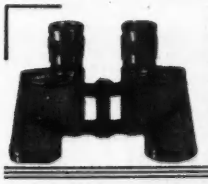

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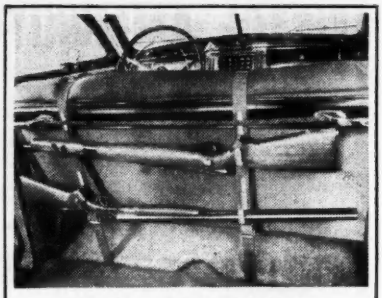

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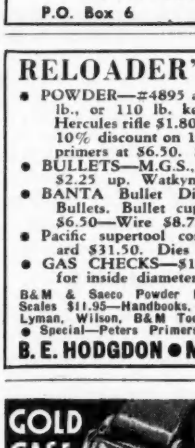

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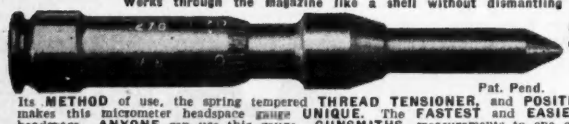

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16-17 (B) UTAH—Utah State .30 Caliber Rif Championship at Fort Douglas, Utah. David Sugden, #3 North 7th West Street, Salt Lake City Utah (Adv)

15-16 (B) NORTH CAROLINA—13th Annu North Carolina State Small Bore Rifle Tournamen at Conover, North Carolina. Glenn Sipe, Route Conover, N. C. (Adv-Ltd)

16-17 (A) CALIFORNIA—Regional Small Bo Rifle Tournament at Los Angeles, California. Mr Gladys Rising, 600 North Mayo, Compton, Cal fornia (Adv-Ltd)

17 (B) WISCONSIN — State Highpower Rif Championship at Racine, Wisconsin. Dexter Rhodes, 3828 West Sheridan Avenue, Milwaukee Wisconsin

23-24 (A) PENNSYLVANIA—Eastern Region Small Bore Rifle Tournament at Harrisburg, Pen sylvania. George A. Spaid, 3017 North Third, Ha risburg, Pennsylvania (Adv-Ltd)

23-24 (B) MAINE—Maine State Small Bo Championship at Damariscotta, Maine. H. Ke neth Smith, 893 High Street, Bath, Maine (Adv

22-23-24 (A) IOWA—Regional Pistol Tournamen at Davenport, Iowa. Carl Prevratil, 110 East Co lumbia, Apt. 2, Davenport, Iowa (Adv-Ltd)

23-24 (B) ARKANSAS — State Thirty Calibe Championship at Little Rock, Arkansas. H. L Remmel, 112 West 9th, Little Rock, Arkansas (Adv

23-24 (B) WASHINGTON — Washington Stat Small Bore Rifle Championships at Seattle, Wash ington. C. M. Styer, 120 West Hudson-Street Seattle, Washington (Adv-Ltd)

24 (B) INDIANA—Indiana State Small-bore Rifl Championship at Anderson, Indiana. Lt. Colon John Friday, Building 115, Ft. Benjamin Harrison Indiana (Adv-Ltd)

30-31 (B) OKLAHOMA—State Pistol Champion ship at Tulsa, Oklahoma. E. M. Fuller, 207 Sout Toledo, Tulsa, Oklahoma (Adv-Ltd)

31 (B) VERMONT—10th Annual Vermont Sta Pistol and Revolver Tournament at Northfield, Ve mont. Louis B. Tims, 4 Wilder Street, Montpelie Vermont (Adv-Ltd)

30-31 (A) WASHINGTON—Regional Pistol Tou nament at Seattle, Washington. C. M. Styer, 1 West Hudson, Seattle, Washington (Adv-Ltd)

AUGUST

6-7 (B) TEXAS—Third Annual Permian Basi Small Bore Rifle Tournament at Odessa, Texa C. W. Sellon, 1003 North Graham Avenue, Odess Texas (Adv)

5-6-7 (B) WASHINGTON, D. C.—United State Park Police Fifth Annual Pistol Tournament Washington, D. C. Captain M. H. Rasberry United States Park Police, Room 1215 Interio Building, Washington, D. C.

6-7 (B) LOUISIANA — Louisiana State Pisto Tournament at Shreveport, Louisiana. J. H. Flour noy, P. O. Box 1094, Shreveport, Louisiana. (Adv Ltd)

6-7 (A) OREGON—Northwestern Regional Smal Bore Rifle Tournament at Portland, Oregon. Herber T. Brown, 7159 S. W. 4th Avenue, Portland Oregon (Adv-Ltd)

12-13-14 (A) ARIZONA—Regional Pistol Tourna ment at Prescott, Arizona. Mack Weiss, Box 102 Prescott, Arizona (Adv-Ltd)

13-14 (B) NEW YORK—Western New Yor State Small Bore Rifle Championship at Auburn New York. Herman Dickman, 214 South Sewar Avenue, Auburn, New York.

13-14 (B) INDIANA—Indiana State Pistol Tou nament at Bristol, Indiana. Mrs. Garnette R. Hos ner, 135 South Scott Street, South Bend, Indian (Adv-Ltd)

13-14 (B) OHIO—Ohio State .30 Caliber Rif Championship at Camp Perry, Ohio. Ray Bayless, 7301 Euclid Avenue, Cleveland 3, Ohi (Adv)

14 (B) MARYLAND—Maryland State Small Bo Championship at Stemmers Run, Maryland. Joh E. Ruppert, 42 East Heath Street, Baltimore Maryland. (Adv-Ltd)

13-14 (A) TENNESSEE—Southeastern Region Small Bore at Chattanooga, Tennessee. Paul Zem 808 South Moore Rd., Chattanooga, Tenn. (Adv Ltd)

20-21 (B) OHIO—Ohio State Individual Sma Bore Championship at Mt. Gilead, Ohio. John Lang, 3498 Meadow Avenue, Cincinnati 11, Ohi (Adv-Ltd)

21 (B) MONTANA—Montana State Pistol Cha pionship at Butte, Montana. Dr. Robert Engle 1405 4th Avenue, Great Falls, Montana (Ltd)

19-20-21 (A) CALIFORNIA — Regional Pist Tournament at Bakersfield, California. Capta LeRoy F. Galyen, California High Patrol, Baker field, California (Adv-Ltd)

20-21 (B) NEW YORK—New York State Sma Bore Rifle Championship at Bethpage, New Yor V. B. Cleaver, P. O. Box 356, Hicksville, Lon Island, New York (Adv-Ltd)

20-21 (B) OHIO — Third Annual Ohio Pist Tournament at Columbus, Ohio. Lt. A. L. Schmeis 368 East Kanawha Avenue, Worthington, Ohi (Adv-Ltd)

21 and 28 (B) HAWAII—Territorial Small Bore Rifle Championship at Honolulu, Hawaii. George Premo, 2323-B Ala Wai, Honolulu 37, Hawaii.

21 (B) WISCONSIN—Fifteenth Annual Wisconsin State Small Bore Championship at Racine, Wisconsin. Dexter F. Rhodes, 3828 West Sheridan Avenue, Milwaukee 9, Wisconsin (Adv)

27-28 (B) GEORGIA—Second Annual Georgia Carolina Rifle Tournament at Augusta, Georgia. O. J. Barrett, Jr., Route #1, Augusta, Georgia (Adv-Ltd)

27-28 (B) MICHIGAN—Michigan State Pistol Championship at Milford, Michigan. Walter LaMoria, Brighton, Michigan (Adv)

28 (B) NEBRASKA—Nebraska State Pistol Tournament at Lincoln, Nebraska. H. H. Buis, 1312 North 35th Street, Omaha, Nebraska.

28 (B) ILLINOIS—Illinois State Small Bore Championship at Naperville, Illinois. Mrs. Lew Mason, 473 Oak Avenue, Aurora, Illinois (Adv)

SEPTEMBER

1-4 (B) LOUISIANA—Louisiana State Rifle Championship at Lake Charles, Louisiana. Peggy Bumpers, P. O. Box 1426, Lake Charles, Louisiana

4-5 (B) WEST VIRGINIA—12th Annual Mountain State Pistol Tournament at Parkersburg, West Virginia. R. A. Simpson, Fort Borneman Rifle Club, Parkersburg, West Virginia

1-4 (B) MICHIGAN—40th Annual Michigan State 30 Caliber Championship at Camp Grayling, Michigan. Henry J. Van Kampen, 557 Navahoe Avenue, Detroit 14, Michigan

4-5 (B) CONNECTICUT—Connecticut Valley Pistol Championship at Rocky Hill, Connecticut. George G. Ledder, P. O. Box 19, Rocky Hill, Connecticut (Adv-Ltd)

10-11 (B) CALIFORNIA—Bay District Rifle Tournament at Richmond, California. Chilton DeWitt, 3701 Lincoln Avenue, Oakland 2, California (Adv-Ltd)

10-11 (B) VERMONT—Vermont State Small Bore Rifle Tournament at Burlington, Vermont. Miss Pauline B. Cadieux, 410 North Street, Burlington, Vermont (Adv)

10-11 (B) NEW JERSEY—11th Annual New Jersey State Pistol Championship at Teaneck, N. J. Frank Svec, Box 42, Leonia, New Jersey (Adv-Ltd)

10-11 (B) NEBRASKA—Nebraska State Rifle Tournament at Grand Island, Nebraska. Harold H. Buis, 1312 North 35th Street, Omaha, 3 Nebraska (Adv)

11 (B) IOWA—Iowa State .30 Caliber Rifle Tournament at Moscow, Iowa. Ruth Maurer, Wilton Junction, Iowa (Adv-Ltd)

17-18 (B) NEVADA—Nevada State Small Bore Championship at Boulder City, Nevada. Mrs. Dorothy D. Cox, Box 453, Boulder City, Nevada (Adv-Ltd)

17-18 (B) NEW YORK—New York State Pistol Championship at Poughkeepsie, New York. Mrs. Martha W. Strahan, 30 Arnold Blvd., Poughkeepsie, N. Y. (Adv-Ltd)

24-25 (B) TEXAS—20th Annual State Pistol Championship at Austin, Texas. Henry Hankey, 1203 Harris Avenue, Austin, Texas (Adv)

24-25 (B) FLORIDA—Florida State Pistol Championship at Clearwater, Florida. C. A. Brown, P. O. Box 253, Tampa, Florida (Adv-Ltd)

(B) UTAH—Utah State Pistol Championship Salt Lake City, Utah. David P. Sugden, #3 North 7th West Street, Salt Lake City, Utah

STOLEN GUNS

Winchester #75, .22 cal., Serial #21241; 1000 rounds .22 cal. ammunition. William A. Regan, Mystic Valley Jr. R. C., 35 Biltmore St., Malden, Mass.

German Luger Pistol, converted to .22 cal. #7599. Sgt. John E. Wells, 1st. Strat. Rcn. Sq., Topeka AFB, Kansas.

Colt .38 Super Auto, Serial #45997. Pfc. Robert Lynch, 512th Recon. Sqdn. (WEA), Suisun-Fairfield AF Base, Fairfield, Calif.

Weatherby .257 Magnum, marked on the barrel, Mauser action number 8282 over number 1. No fixed sights other than the scope, Maxwell G88. Inside of the stock marked "Made by Leonard Brows, South Gate, Cal. 6-25-46." James O. Austin, 708 South Goodwin St., Urbana, Ill.

Colt, Frontier Revolver, .45 cal., Serial #193380. J. McShane, Rifle Team, NMMI, Roswell, New Mexico.

1937 8mm. VZ24 Mauser-Herter stock, Lyman Sight #70 Rear, Serial #P66558; Enfield, Bishop Peep, Lyman ramp, Redfield #70 Rear, Serial #93280. Lewis E. Yeager, 4901 Jackson, Rt. #4, Dearborn, Mich.

Enfield Sporter .30-'06, Serial #845219. William Kress, 422 Venture St., Pittsburgh, Pa.

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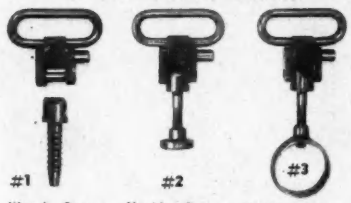

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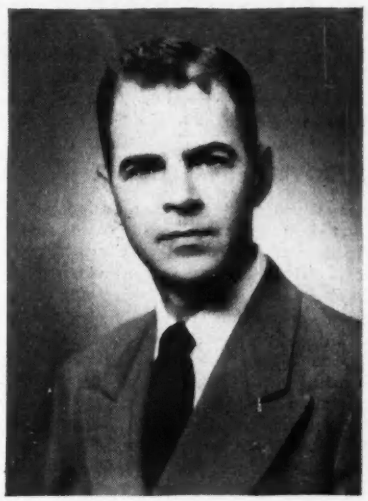
ALAN DU BOIS



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IMPROVED HD-M TRIGGER

It all started when I tried to dope out just what the little extra something was that my Walther .22 PPK had that I wished my favorite HD-M had. It was in the trigger, but why? I had polished them both to 2½ pounds with clean crisp let-off, but the little PPK just fired and nothing at all seemed to happen to the trigger—it felt exactly the same the instant it fired as before. Close examination disclosed the secret. The automatic safety bolt, which is pushed upward against the pressure of a rather stiff, small coil spring as the sear is raised, acted as a buffer. The downward pressure of the safety bolt under the power of the small, stiff coil spring was evidently nearly equal to the amount of pressure required to pull the sear upward until it disengaged from the hammer notch. Thus, we have built into the action of the PPK a trigger dampening buffer closely parelleling the one employed on the U.S.R.A. model used to establish U. S. free pistol record (AMERICAN RIFLEMAN, May 1948).

The next step was to try to employ such a device to my HD-M. These very fine target arms come from the factory equipped with a trigger stop screw just beneath the barrel in the forward part of the receiver above the trigger guard. This screw can be turned in until it stops the movement of the trigger at just the instant the gun fires. I have experienced the effect that was experienced by Brig. Gen. S. R. Hinds in using 'stonewall' trigger stops. There is definitely a jerk in the forearm caused by muscle contraction. For me, this was worse with the stop than without. Here was the thing I must correct if I hoped to get away from the wild shots in the 7-ring. It is easily done, and you may wish to try it.

The original trigger stop screw is standard 10-32. There is a thin partition in the trigger stop screw hole which is for the purpose of forming a seat for the trigger spring. This partition is quickly and easily drilled out with a No. 20 drill and the hole tapped all the way with 10-32 tap. Fit a stronger spring ⅞-inch long and put behind it a 10-32 machine screw. The screw can be turned in to obtain the desired tension. If the screw, when cut off and slotted deeply, is spread slightly in the slot it will bind enough in the hole so as not to shoot loose. You will note that the trigger assembling job is simplified, as the spring can be slipped in from the front.

This does not by any means make me an expert with my HD-M, but I now have a trigger very closely resembling that PPK and as a result I have pulled many of those fliers in out of the 7-ring, especially in rapid fire. —FAY BROWN, Andover, N. Y.

PUZZLING PISTOL

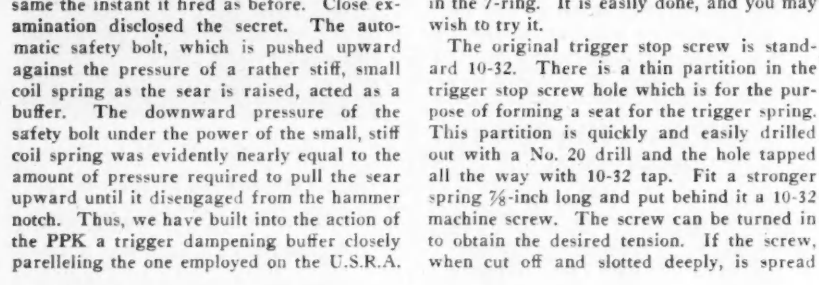
Can you tell me who built this pistol and when? It was picked up in Japan and the Jap that had it said the pistol was around 70 years old and German. It has no name but the No. 434 is on several parts. The pistol is very well machined inside and pretty well outside. I believe it is chambered for the .32 ACP cartridge since the cartridge will chamber in it all right, but I have not fired it as I don't know about the pressures of our present ammunition.

To actuate the gun, one loads and inserts the clip, pulls the barrel forward into battery, or until the sear catches it. The barrel has an actuating spring around it pressing on the front of the frame and tending to push the barrel to the rear. Pulling the trigger and grip safety releases the barrel which under spring tension travels to the rear, picking up a cartridge from the clip and chambering it, and then goes back against a fixed firing pin which fires it.

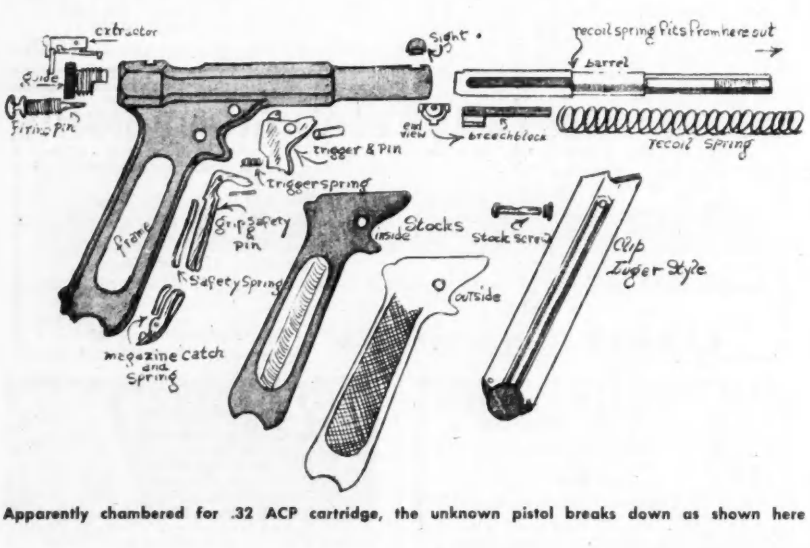
The projectile traveling out the barrel cocks the firearm by friction on the barrel, the extractor holding the cartridge case till it is free of the chamber, when the breechblock fitted in a groove in the barrel kicks it out the open port.

When the empty case is kicked out of the gun, another comes up in the clip between the barrel and the breechblock, and pulling the trigger completes the process.—JO FAY, JR.

Answer: We've never seen anything like this one. The blow-forward barrel is reminiscent of some early Mannlicher designs, but the shape of the grip and forward safety and the adaptation of the Luger magazine make us think this gun is probably an early Japanese model. If any reader has any information, we would appreciate receiving it. —J.S.H.



Picked up in Japan, unknown pistol has a blow-forward barrel resembling early Mannlicher designs



Apparently chambered for .32 ACP cartridge, the unknown pistol breaks down as shown here

.50-CALIBER MACHINE GUN POWDER

Is .50-caliber powder good in rifles? Actually there are several powders loaded in the .50-caliber machine gun, depending on the bullets used. Among them are IMR Nos. 4814, 4831, 4903, 5010 and others. With an average charge of from 225 to 240 grains loaded in .50-caliber ammunition, you get a lot of powder when you start to break the cartridges down.

I tried .50-caliber powder in the 7x6 Mauser with Western 175-grain bullet. Chronographed, the instrumental velocity with 48 grains ran 1681 foot-seconds; 5 grains gave 1828 foot-seconds; 52 grains showed 1926 foot-seconds and 54 grains gave 2004 foot-seconds. A 56-grain charge required considerable compression to make room for the bullet but only recorded 212

foot-seconds. All pressures appeared low and the bullets grouped fairly well. For comparison, 52 grains of No. 4350 (maximum load) chronographed 2510 foot-seconds. Make your own comments on .50-caliber powder.—PHILIP B. SHARPE.

Note: We too have tried .50-caliber machine gun powder, Army lot No. 2539, in .30-'06 and Improved .30-'06 calibers. Even the heavy 250-grain Barnes bullet in the '06 with 54 grains of this powder, which was compressed, gave very low velocity, as the impact at 100 yards was 6½-inches lower than for the same bullet and 51 grains of No. 4350 powder. Accuracy was fair, though. In the Improved '06 we used 57 and 59 grains of .50-caliber MG powder with the same bullet, and the 59 grains actually were compressed so much that the powder dented the cartridge case from the inside. The load was fired and the bullet landed 8 inches lower than when using the same bullet with 55 grains of No. 4350, which is a heavy but safe load. Since the same bullet was used with both kinds of powder, we know the lower point of impact meant much lower velocity. We are about convinced that .50-caliber MG powder is not suitable for any of the riffle cartridges, with the one possible exception of Barnes special 6.5-mm. caliber. —A.H.B.

IMR 4895 LOT VARIATIONS

We are frequently asked to furnish loading data for various lots of IMR No. 4895 powder obtainable through the DCM. We are directly familiar with only two lots. One is IMR 4895 lot No. 2186 which is similar to IMR No. 4064 as to loading data, as shown by the velocity and pressure figures given on page 33 of the June 1949 RIFLEMAN under "Loads For The .257." The other lot is IMR 4895 lot No. 27277, which we load using IMR No. 3031 powder as a guide.

We have received arsenal data sheets on two other lots of No. 4895 which are very similar to lot No. 27277, as shown below.

Bullet	Powder Charge	Lot No.	Corrected Vel. 78 Ft.	Corrected Mean Pressure
166 gr. AP M2	49.5 grs.	27272	2,713 f.s.	48,860
166 gr. AP M2	49.8 grs.	27277	2,713 f.s.	47,470
166 gr. AP M2	49.6 grs.	27278	2,718 f.s.	47,160

We can see that the three lots of powder listed are so nearly alike that for all practical purposes loads given for one will be satisfactory for either lot. We, therefore, suggest using No. 3031 as a guide in loading any of these three lots.—A.H.B.

COMBINATION '06 LOAD

Frequently we are asked to furnish full-power .30-'06 loads with hunting bullets and then another load with a lighter bullet for short-range use that will shoot to the same zero without sight adjustments. For years now George Sweeney, 1183 Oak St., S. W., Atlanta, Ga., has been praising his combination of the old 145-grain hollow copper tube bullet with 50-grains HiVel No. 2 for deer hunting and the 150-grain metal-patched bullet with 28 grains of No. 2400 or 27.4 grains of No. 4064 for grouse and squirrel. With the 145-grain bullet sighted in at 200 yards, the lighter loads will shoot right on at 50 yards. Probably some other available 150-grain bullet could be substituted with the full load for the unobtainable 145 grain. The load of 50 grains of HiVel might have

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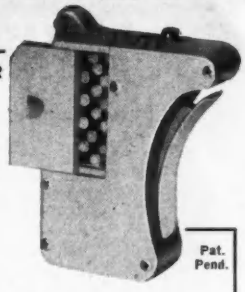

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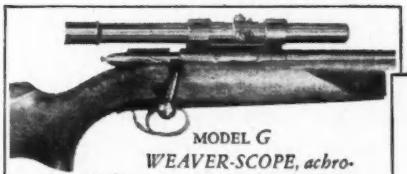

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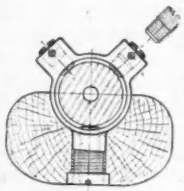

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to be cut in some rifles, as it can be on the heavy side, especially when the bullet weight is increased slightly.—A.H.B.

IMPROVED .30-'06 CARTRIDGE

Probably the almost instantaneous enthusiasm and interest in the Improved .30-'06 Ackley cartridge was due to the way it was written up in the RIFLEMAN, August 1948, by William H. Corson. He called it a Miser's Magnum and listed some terrific loads for the caliber, several of which appear too high to be safe in all guns.

Because of the interest in the Improved '06 we have had a restocked model 1917 Enfield rechambered, with very tight headspacing, for the cartridge by L. H. Brown of Kalispell, Mont. The more we use the Improved '06 the better we like it, but we are not yet calling it the equal of the .300 H&H Magnum. The cartridge case holds about 4 grains more powder than the standard .30-'06 case and the safer loads used are about 4 grains more. Four grains of powder such as IMR No. 4064 will give approximately 50 foot-seconds increase in velocity for each grain, or 200 foot-seconds increase over heavy loads in the '06 case.

A favorite load in the Improved '06 is 55 grains of IMR No. 4064, exactly 4 grains more than is recommended as maximum in the '06 case, with 180-grain bullet. The velocity in the '06 is 2765 foot-seconds, so at most we could be getting 2960 foot-seconds velocity in the Improved version. With the new, very accurate 180-grain Sierra Spitzer bullets, the load is extremely flat over 500 yards. When zeroed on aim at 200 yards, the impact was .9 inch high at 100 yards, 10 inches low at 300 yards, 20.36 inches low at 400 yards, and 47 inches low at 500 yards. In the same rifle we are getting very fine accuracy with the 250-grain Barnes bullet using 55 grains of No. 4350 powder with Winchester No. 120 primers. It will shoot in 2 minutes of angle regularly up to 400 yards. With the load zeroed on aim at 200 yards, impact is 3.25 inches high at 100 yards, 15.75 inches low at 300, and 40 inches low at 400 yards.

Shooting the 55 grain load another day, but at 100 yards using a 2½X Texan scope and the 180-grain Sierra bullet, we had consecutive 5-shot groups of 1.02 inches with 4 in .65 inch and 1.11 inches with 4 in .88 inch. Such grouping is just about target accuracy with any '06, in fact we obtained practically the same groups in a heavy-barrel .30-'06 Martini.

Other loads which perform well are 57 to 57.5 grains of No. 4064 with 150-grain Sierra bullets and with a new pencil-point 150-grain bullet by J. W. Hornady, 324 W. 4th St. Grand Island, Nebraska, which is very accurate for high-velocity loads. We also use 60.5 grains of No. 4350 with the 180-grain bullet.

The Improved .30-'06 cartridge is a fine, accurate cartridge when sensibly loaded within the 4-grain limit of loads used in the .30-'06.—A.H.B.

NEW HOLLYWOOD RELOADING TOOL

The new Hollywood reloading tool, given brief mention in the February RIFLEMAN, is now available. It is unquestionably one of the most rugged tools on the market, and it has several other desirable features. One of these is plenty of clearance around the shell

holder with not a single obstruction to get in the way while handling the cartridge to and from the tool.

The outstanding feature, as mentioned above, is ruggedness and we even sized down a .30-'06 cartridge to .250 caliber in a single operation. Plenty of power, however, must be put on the handle for this purpose and Mr. Corcoran assures us that no damage will be done to the tool by any shell reducing. The tool has already been used for making .25-caliber bullets and soon tests will be made for forming .30-caliber bullets. The .250 shell forming operation was done with the tool merely clamped, using two C clamps, to the top of a moveable table. This is possible because all heavy work is done on the downward travel of the operating handle. The new Hollywood tool is undoubtedly the tool a lot of reloaders have been looking for.—A.H.B.

SANDWICH PISTOL KIT

The pistol kit pictured here for a .45-.22 combination was made by bandsawing open-

Homemade pistol kit

ings, to fit, out of a solid plank of wood and sandwiching it between two pieces of plywood. The top slab of plywood is, of course, hinged. The kit was made by Mr. J. H. Murphy of Saginaw, Michigan.

SCOPE MOUNT DRILL JIG

Mounting scope blocks or hunting scope bases and getting them properly aligned is sometimes a problem even for a gunsmith. Claude E. Roderick, custom gunsmith, of 110-112 Second Street, Monett, Missouri, is now selling a special jig with which, with the jig fixed in one position, it is possible to mount blocks 7.2 or 6 inches apart. Other spacing can be obtained by moving the jig.

The jig insures getting the holes in line along the barrel, though it is of course necessary to square the jig with an accurate flat on the receiver or barrel. One end of the jig bar is relieved at the bottom to span the receiver ring. The jig holes are lined with hardened bushings and are the right size for a No. 31 drill. In addition to being useful for mounting target scope blocks, the jig is helpful for mounting some hunting scope bases.

Last week I used one of these jigs for mounting some blocks on a target rifle. After leveling it on the receiver by means of try squares, I put the blocks on in less than half the usual time and they were absolutely square. The jig sells for $9.00. Mr. Roderick states that he is making other simpler special

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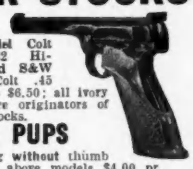

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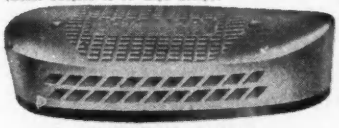

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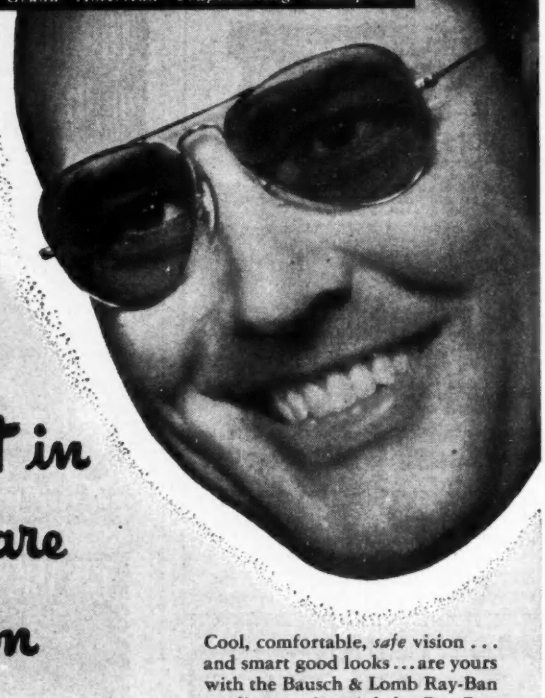

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CUSTOM LOADS AND BULLETS

The latest development by the M&G Sportsman Shop, 15349 Paramount Blvd., Clearwater, Calif., is a new 180-grain closed-base .30-caliber bullet. Samples received mike .3075inch diameter, but they have shot very well in a number of our rifles. The bullets also shot well in an Improved Ackley '06 Enfield, using 60.5 grains of No. 4350 powder. One group was less than 3¼ inches at 200 yards using a 2½X scope. However these bullets did not shoot quite as well as others of equivalent weight in our heavy-barrel Martini test gun.

We have just received samples of the M&G closed-base bullets in .270 caliber, which we will try in an exceptionally accurate FN .270 stocked with a fine piece of wood by E. C. Bishop. This rifle with the latest 130-grain M&G soft-point bullets groups regularly in 1 to 1¼ inches using a 4X Weaver scope and a load of 49.5 grains of No. 4895, lot No. 27277.

Some excellent bullets recently tried in .30-caliber rifles are made by Jack Whitworth of Kline, Colorado. These are made of copper tubing with relatively blunt soft points and the base practically enclosed. We have tried them in 125-grain weight using 57 grains of No. 4064 in an Improved '06 rifle. This is an exceptionally accurate but mild load for the cartridge. The 150-grain Whitworth did best in the Improved '06 rifle with 56.5 grains of No. 4064.

All experimental loadings for these two bullet weights have gone under two inches at 100 yards with most of the shots in 1½ inches or less, but the best of the Whitworth bullets so far is one weighing 175 grains. In the Improved '06 we had excellent results with 60.5 grains of No. 4350 and Winchester 120 primers. The same bullet in a Martini bull gun placed all ten shots of one group in 1.2 inches at 100 yards.

We have also tried 150-grain, 170-grain and 174-grain bullets made by A. A. Easton, 1116 S. State St., Salt Lake City, Utah, with newly designed dies for his Easton press. Limited tests are very encouraging. In the Martini rifle, using the 150-grain with 52 grains of No. 4895 and FA70 primers, all but two shots grouped in .87 inch at 100 yards. The 170 grain did nearly as well.

Other good '06 hunting loads are custom combinations by Marion M. Wambach of Poplar, Mont. His load using 110-grain Speer bullets consisted of 50.5 grains of No. 3031 with .033-inch Ipco wad and 150-grain Speer bullets with 50.5 grains of No. 4064. These were very nicely prepared handloads and reasonably accurate. They were unquestionably safe loads.

Good results were obtained with a low-velocity target load and a high-velocity jacketed bullet load for the 8.15x46-mm. cartridge. The heavy load in the series of custom loads by Fred M. Seguin, 2218 Tower Avenue, Superior, Wisc., consisted of 29.6 grains of No. 4895 powder and a 170-grain soft-point bullet. This was an exceptionally nice, snappy load to shoot. The best combination in our rifles happened to be the heaviest hunting load for the 8.15 cartridge. Other good loads by Seguin are for the 7.7- and 6.5-mm. Jap.

Only six samples of the new 180-grain .30-caliber Super Match Norma boattail bullet

were received from Ashton & Co., 1511 N. Gardner, Hollywood 28, California. We loaded five of these with our favorite intermediate load of 38.5 grains of No. 4895, lot No. 27277, with FA70 primers, for use in a very accurate Springfield service rifle. Four out of the five shots went into less than an inch and we are now waiting for more bullets to verify these encouraging results.

In the same Springfield rifle, with 175-grain Whitworth bullets and 56 grains of No. 4350 powder, all shots were inside 1½ inches at 100 yards. The 180-grain M&G bullets with the same load did nearly as well.—A. H. B.

PISTOL PRIMERS IN RIFLE LOADS

Noting the write-up about the use of pistol primers in rifle loads, I wish to state that I have tried pistol primers with 12.5 grains of No. 1204 behind the 47-grain hollow-point plain-base lead bullet No. 25951 in the .25-20 WCF case and noted no signs of punctures or gas leaks. Cartridges loaded with No. 1½ and No. 108 pistol primers would penetrate a quarter-inch steel plate, as would the same loads using the corresponding rifle primers. The factory-loaded 60-grain open-point Hi-Speed bullet went only half-way through the plate.

I also used RA No. 2½ pistol primers in place of Winchester No. 115 rifle primers in .30-30 Winchester cases with a full charge of No. 4198 behind the 150-grain open-point factory bullet without any trouble.—GORDON C. BOSER, Springville, N. Y.

.256 NEWTON LOADS

I would appreciate very much information about loads for the .256 Newton with present DuPont powders, or a rule that I could follow, using the loading table given by Phil Sharpe in his *Complete Guide to Handloading*, to load for it.—R. B. THOMPSON, Camp Hill, Pennsylvania.

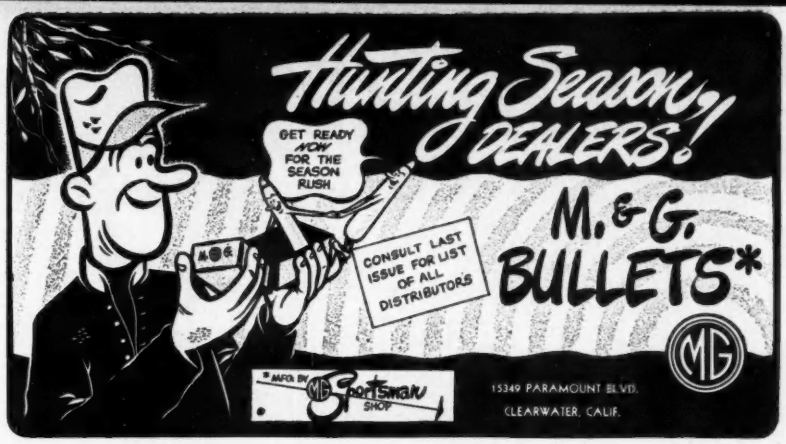
Answer: The .256 Newton loads recommended in Sharpe's book are generally for the older powders. For the newer series of DuPont powders, you would use No. 3031 instead of No. 17½ and No. 4064 instead of 15½. Generally, for a given bullet weight you would have to stay somewhat below the maximum recommended charge of the older style powder when substituting the modern series.

Some suggested loads for the .256 from reliable sources are 45.5 grains of No. 4064 with 125-grain Barnes bullets and Remington 9½ primers. Also, 42 grains of No. 4350 has been used with the 160-grain bullet. Another recommended load is 48 grains of No. 4320 with 100-grain bullets, or 44 grains of the same powder with the 129 grain. The same charges of No. 4064 have been used with the 129-grain bullet and velocity has been estimated at around 2800 foot-seconds.—A. H. B.

CASE REDUCING PROBLEMS

I am having difficulty pushing back the shoulder on .219 Zipper cases for the .219 Donaldson Wasp. Do you think there is any danger of over-annealing the neck of the case? Also, would you please give me the general procedure used in annealing cases. I think I possibly may have a bunch of hard brass. They are new and unfired factory cases.—TORENCE J. CURTICE, Canton, Ohio.

Answer: If you are annealing the necks of your cases before reforming, that may be the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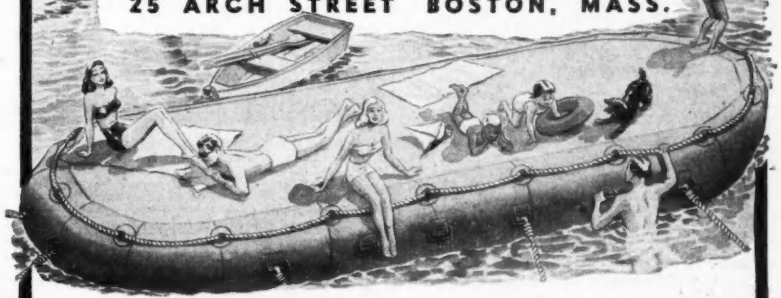

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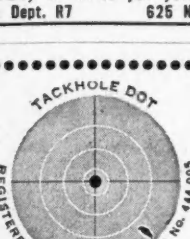

T. K. LEE

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cause of your trouble as the necks would be too soft and would not have strength enough to stand up under the reforming operation. They should not be annealed until afterward.

Of course your trouble may be, as you say, with the brass. We find that some lots of factory cases are almost impossible to reform while others reform easily.

Something that helps greatly is using graphite as a lubricant in your sizing die and on your cases. Another thing that helps is working your resizing press very slowly and deliberately.

A good way to anneal cases is to take a piece of hard asbestos board and bore a hole in it that will just allow the neck and shoulder of the case to stick through. Then using the full flame of a blowtorch so it will heat very quickly, play it on the neck of the case until a dull red color shows and immediately drop the case in water before the heat has time to run down to the head.—J. S. H.

THE 44 AND 44½ STEVENS

What is the difference between the No. 44 and 44½ Stevens? Is the No. 44 strong enough to stand rechambering to the .22 Hornet with a relined barrel?

Could you recommend a gunsmith who might be willing to reline the barrel to .22 Hornet, providing the action on the No. 44 is strong enough to stand it?—BRUCE H. MCGARRAH, Canton, Illinois.

Answer: There is a great difference in the strength of the 44 and 44½ Stevens actions. If you have the two together there is no question about identifying which is the 44 and which is the 44½. To tell the difference between the two actions, look to see whether the breechblock slides up and down in grooves in the receiver almost identical to the Winchester High Wall mechanism or whether the breechblock hinges or swings back on a pivot or crosspin in the action. The gun with the sliding breechblock is the 44½.

The 44½ is much stronger than the other and it can be used for a number of our wildcat cartridges when rebarreled. I personally would not recommend the 44 action for the .22 Hornet, although I know it has been used. Continued use will cause the breechblock pin to wear, and excessive headspace will eventually give trouble.—A. H. B.

DON'T CUT THAT BOLT HANDLE!

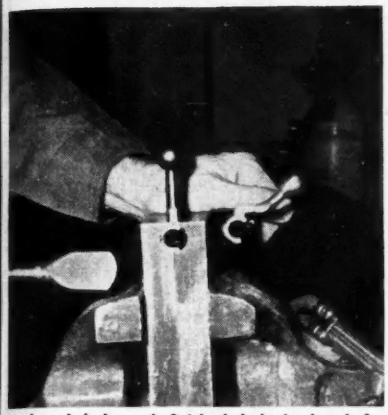
When altering bolt handles on the Mauser and Springfield rifles to clear low-mounted scopes, the usual practice is to cut the handle all or part way off and weld it on again. This method had many disadvantages. In welding, the heat treatment is destroyed in the rear portion of the bolt and the camming surface is left soft; also heavy scale is formed on the threads inside the bolt in welding, necessitating cleaning before the sleeve will screw back in, and bubbles and cracks leave the handle in a weakened condition. Forging with properly made blocks and forming tools eliminates all this.

To make the blocks, two pieces of 1x3x6-inch cold rolled steel are doweled together into one rigid piece. They are then bored out to take the bolt, Mauser in one end and Springfield in the other, leaving only the handle protruding through the top. The accompanying illustrations show step by step how the forging is done.

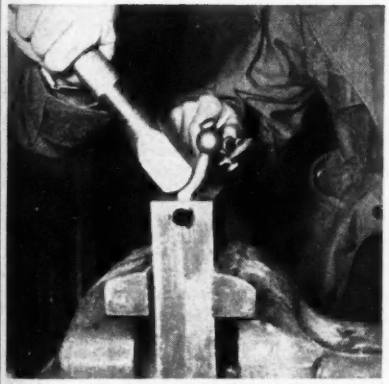
The heavy blocks draw the heat from the

bolt rapidly, preventing annealing and the formation of scale. The finished bolt is as strong as before, because the original metal is merely bent over.

Don't cut and weld that bolt handle, hammer it!—LESTER WOMACK, Trinidad, Colo.



Unaltered bolt and finished bolt in hand for comparison. In case of Springfields and Mausers with handle bent down, handle should be heated and brought up straight before forging is started. Note that bolt is completely surrounded by blocks, which draw heat and prevent annealing



Handle is heated rapidly with acetylene torch. Curved face forming tool is placed against handle and hammering is begun. As handle is bent over, it takes radius of forming tool. Heat is kept on handle throughout forming operation

After bolt is bent down, flat faced forming tool is used to drive 'sweep' into handle. Next, bolt is set in water up to handle and allowed to cool slowly. Handle may be dressed down and polished out. Small recess is cut into receiver to accommodate handle in new low position

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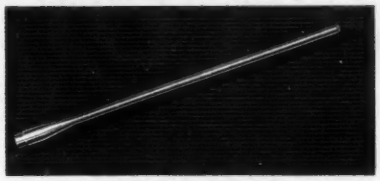

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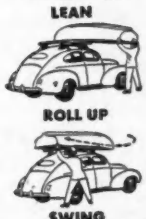

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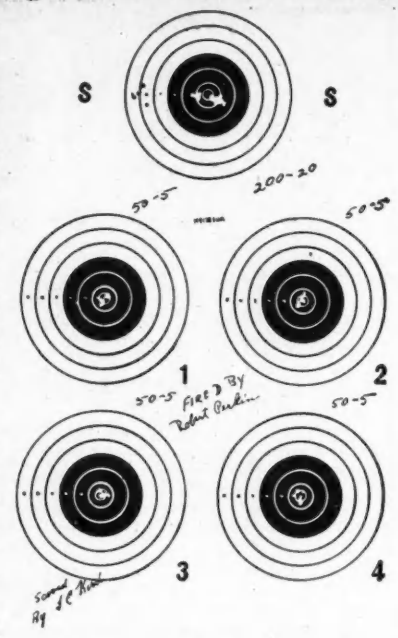

Robert E. Perkins Calif. State Small bore champion, 1949. Pacific Coast Regional champion, 1949. New World's course record, 1949.

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Since we are going to tool up for the process of installing .257 Roberts Improved barrels, we would like your opinion on the following.

What is the degree of slope on the shoulder, twist per inch for various cases and bullet weights, length of barrels, and any other information that you would consider helpful?—JOHN HELMERICKS, Montrose, Colorado.

Answer: The only Improved .257 with which I am familiar is the one made by Ackley. I understand he uses about a 40-degree shoulder angle, but of that I am not sure. Chances are Ackley would not mind giving you the specifications, or perhaps better (in order to keep things as near standard as possible), he would furnish the chambering reamers. I know he does this for other gunsmiths.

You would use the same rifling twist for the Improved Roberts as for the straight .257. The standard twist is one turn in ten inches when you want to use 117- to 125-grain bullets. For any pointed bullet up to the 100-grain, the best twist would be one turn in twelve inches, or even one turn in fourteen inches to equal the old .250 Savage. I am having a fourteen-inch twist put in a new .250 barrel, although most of my others are one turn in twelve inches, which does not stabilize the longer bullets.

Barrel length is dependent on such things as balance and the requirements of the customer. I personally prefer them no less than 26 inches long.—A. H. B.

NEW PRODUCTS

Bear Cub 4X scopes to be marketed soon by Stith Mounts, 500 Transit Tower, San Antonio, Texas, will be sold in two different models, the Bear Cub Master 4X and the Bear Cub 4X. The Master model does not have internal adjustments and is designed for use with Stith Master Mounts incorporating both windage and elevation adjustments. The Bear Cub 4X has internal windage and elevation adjustments based on the same principle as those on the Stith Bear Cub 2.5X, which are excellent.

Mr. E. O. Kollmorgen, President of Kollmorgen Optical Company, producers of the scope, showed us one of the advance models of the Master 4X. The optics are superior and the internal adjustment movement positive. Though we haven't made our tests the magnification, we are promised, is a full 4X with a field of view of 30 feet at 100 yards. The body tube is turned from a solid bar of light alloy, which makes the turret an integral part of the tube and requires a split ring mount be used in mounting the scope. The Master 4X (without internal adjustments) is now on the market. Delivery on the Bear Cub adjustments will start in September.

Other specifications on the Master 4X scope are: objective diameter—33 mm. length—11 inches, weight—8 ounces, tube diameter—1.023.

The Bear Cub Master 4X retails at $55.00 and the Bear Cub 4X at $85.00.

☆ ☆ ☆

Winchester model 25 12-gauge shotgun announced by Col. W. F. Siegmund of Olin Industries, Inc., is a slide-action, solid-frame repeating shotgun holding four shells in the

magazine and one in the chamber. The 28-inch barrel is chambered for the 2¾-inch shells and is available in either full or modified choke. The stock, made from American walnut, has a pistol grip and semi-beavertial forearm. It will be supplied in 12-gauge standard grade only.

☆ ☆ ☆

Bluing solution for which the manufacturer, Elwood L. Gosse, Sheboygan, Wisconsin, claims no new, revolutionary principles is based on the ten-day rusting process. Gosse says, "The process is, however, accelerated to the point where, on some types of steel, an almost perfect finish is obtained with only one coat." With the solution comes a sixteen-page instruction book. Price of the solution is $1.00.

☆ ☆ ☆

'P.D.Q.' sling swivels being sold by the Armstrong Gun Accessories Corp., 475 Fifth Ave., New York City, are so named because they can be easily and quickly removed from the base, which is inletted flush with the wood. Though the swivels can be rocked back and forth in the base, they are non-swiveling, a feature highly desirable to a lot of shooters. Another feature which will interest the hunter is the fact that the swivels are silent and always under spring tension. The swivels are not finely finished but they are entirely practical. Retail prices per pair is $3.45.

☆ ☆ ☆

Custom rifle kit can be supplied to sportsmen interested in doing some of the handwork necessary to the fitting of a custom-made rifle by A. P. Michaels, 2011 S. E. Lambert Street, Portland 2, Oregon.

The basic kit consists of the latest type FN Mauser action with an American-made chrome-moly sporting weight barrel chambered for either the .30-'06 or .250 cartridge, with others available on special order. The action and barrel assembly is completely blued and pre-fitted with Redfield 102 rear and a neat ramp-type front sight.

The walnut stock, of Monte Carlo type with cheekpiece, is completely inletted and shaped with rough sanding completed. Grip cap, fore-end tip, and Hawkins buttplate are attached to the stock. With the kit also are necessary finishing materials consisting of Michaels Hi-Rez stock finish, rubbing compound, and abrasive papers.

On special order, Michaels can furnish kits with checkered stocks and sighting equipment according to the customer's specifications.

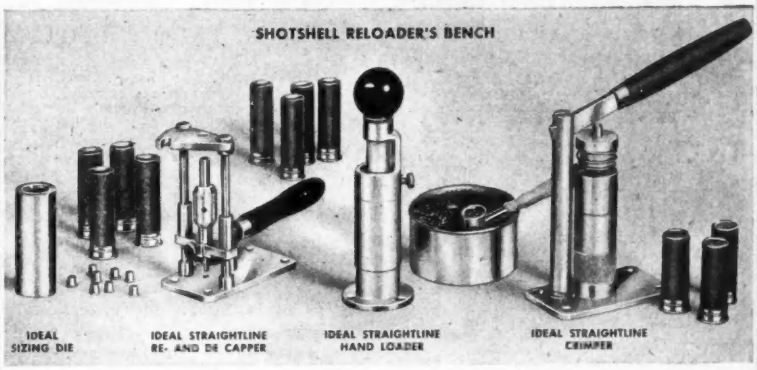
List price of the standard kit is $128.75, F.O.B., Portland.

☆ ☆ ☆

Gun sling which disappears into the butt-stock of a rifle or shotgun is being manufactured by Romac Company, Inc., Harris, New York. Installed through the butt (under the buttplate), the sling is contained in a spring-loaded spindle in a stainless steel case and comes out through a slot in a plastic inlay where the rear sling swivel is normally attached. To use the sling, the ring on the end is grabbed, the sling pulled out and the ring hooked onto the front sling hook. After using the sling, the ring on the end is unhooked and the sling winds up on the spindle. The Romac disappearing gun sling sells for $7.00.

NEW Lyman

SHOTSHELL RELOADING TOOLS



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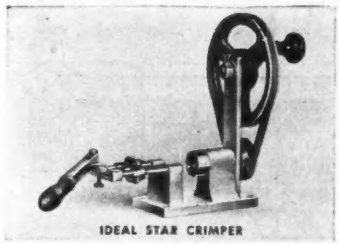
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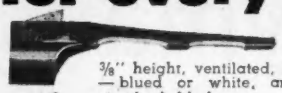
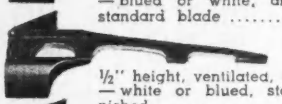
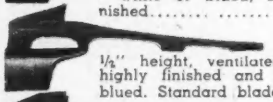


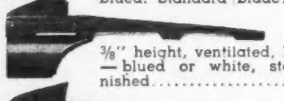
Model BP-1
3/8" height, ventilated, beautifully finished — blued or white, and furnished with standard blade **$6.00**



Model BP-2
1/2" height, ventilated, beautifully finished — white or blued, standard blade furnished..... **$6.35**



Model BP-10
1/2" height, ventilated, streamlined tail, highly finished and available white or blued. Standard blade..... **$7.00**



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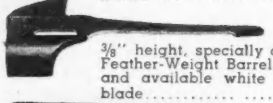
3/8" height, ventilated, beautifully finished — blued or white, standard blade furnished..... **$6.50**



Model OP-10
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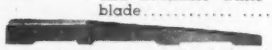
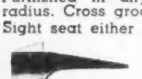


Model P-1
Furnished in any specified height, length or barrel radius. Cross grooved to prevent glare. White or blued. Sight seat either dovetail or slot **2.15**



Model SP-1
3/8" or 1/2" height, beautifully finished — white or blued. standard blade..... **$5.00**

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Same as SP-1, except for more streamlined design and groove..... **$5.00**

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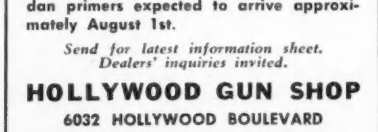

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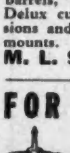

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Palm rest for most bolt-action rifles is now being produced by M. H. Canjar, 4476 Pennsylvania Street, Denver 16, Colorado. The rest can be used on different rifles if extra mounting bases for those rifles are procured. List prices are $9.00 and $10.00, depending on the model of rifle. Mr. Canjar also makes an adjustable butt plate with folding prong or horn for use in the free rifle off-hand position.

☆ ☆ ☆

Plastic sealer finish called Tri-Pak Uneek, being produced by Tri-Pak Gun Kit, Inc., is a transparent plastic resin sealer which the manufacturer claims will not chip, crack, blister or peel and is resistant to water, weather, grease, oil, alcohol and most common acids. It is further claimed that it can be applied to wood, leather, fabric, paper, brass, chrome, nickel, copper and silver. The sealer can also be used on painted, lacquered, shellaced or varnished surfaces. List price for a 1½-ounce container of Tri-Pak-Uneek is 50¢.

☆ ☆ ☆

Lucifer electric heat treating furnaces produced by Gilbert S. Simonski, 401 N. Broad St., Philadelphia 8, Pennsylvania, are particularly suitable for the gunsmithing trade. The smallest one has a muffle size of 6x6x9, heats to 2000 degrees F. within an hour, and is priced at $155.25 F.O.B. factory. It comes complete with pyrometer, thermo-couple and all necessary controls. (Frankford Arsenal and Paul Jaeger in Jenkintown are local users.)

Lucifer furnaces are suitable for case hardening, drawing, tempering, annealing, hardening, etc. Elements are guaranteed for one year and easily renewed.

Larger sizes run to $534.75. Literature on all models is available from the maker for the asking.

☆ ☆ ☆

Jiffy Sling Keeper produced by Product Research & Sales, 1750 W. Lawrence Avenue, Chicago 40, Illinois, is a simple but extremely effective sling keeper. It consists of two streamlined pieces of plastic joined by a strip of metal top and bottom. As the keeper is pushed toward the arm, the leading ends of the plastic parts are pushed out forcing the rear serrated ends into the strap. To release the keeper, the leading ends are squeezed together and it slides free on the strap. It is one of the most satisfactory keepers that we have used as it is easily tightened or loosened in the prone shooting position and stays put. Retail price of Jiffy Sling Keeper is $1.00.

Sports glasses with side shields and an inset visor which extends out from the top of the frame to help protect the eyes from the sun are particularly well adapted to pistol shooting. They can be obtained with different types of lenses, Sharpsite, Ray Ban, Britesite or Smoke. The goggles with smoke lenses we had for trial are very restful to the eyes on a bright day, however, the brighter lenses would probably suit most people. The lenses can be furnished ground to your prescription.

The frames and side shields of the glasses are made of dark plastic. In spite of the visor on top of the frames, the goggles are not unattractive. List price with smoke lenses is $9.50, with Sharpsite or Ray Ban lenses, $12.00, and with Britesite lenses $14.50. The goggles are French made and sold by Belz Opticians, 2 East 44th St., New York 17, New York.

GUNSMITH TRADE DOPE

Pat Mulligan, gunsmith of 240 Ruxton Ave., Manitou Springs, Colorado, who has been well-known for his work on relining rifle barrels, passed away suddenly May 9, of a heart attack, according to a letter just received from his widow.

She writes: "I am trying to get things straightened out in the shop and get all the guns back to the owners. It is quite a job, as he had guns from all over the United States and Alaska, so I thought perhaps it would be a good idea to announce this in our next issue of THE RIFLEMAN."

Mr. Mulligan was one of the few gunsmiths who could be counted on to do good relining work, and we have heard many compliments on his work. His untimely death is a distinct loss and our sympathy goes out to Mrs. Mulligan.

☆ ☆ ☆

W. R. Hutchings, 4504 W. Washington Blvd., Los Angeles 16, Calif., can now furnish what he calls varmint target-type stocks for Enfield, Springfield and Mauser rifles. These are well inletted, like other Hutchings blanks, but the bottom cuts for trigger guard and magazine box have been eliminated. The style is popular among participants in the fast-growing sport of bench rest shooting. The idea of the stock is to add support to the barrel by having a stronger section through the receiver part of the stock.

☆ ☆ ☆

Vernor Gipson, P. O. Box 156, North Salem, Indiana, says that he is now in receipt of a trade-mark registration covering the name "Wasp". He is, of course, referring to the wildcat cartridge frequently called the Donalson-Wasp or .219 Wasp—one of the most popular wildcat cartridges today, particularly among bench rest shooters. We are informed that the registration covers rifles, loading tools and ammunition.

☆ ☆ ☆

E. C. Bishop & Son, Inc., Warsaw, Mo., informs us that the well-known stockmaker Reinhart Fajen is incorporating all the assets, prestige and good will of his concern with the Bishop Company. They intend to go into the finished stock business seriously, meaning that a complete ready-to-use stock will be available from their firm. Plans at present are for finished stocks in sporter, sporter and target types.

☆ ☆ ☆

J. R. Buhmiller, the barrelmaker, of Kalispell, Mont., requests that anyone interested in the single-shot action described on page 9 of the April 1949 RIFLEMAN direct all inquiries to Clifford B. Bogle, City Route 8, Maryville, Tenn. Mr. Buhmiller states that Mr. Bogle has had that design of action for some years now.

Mr. Buhmiller further states that the original rifle, which is covered by patent No. 2289098, was proof fired finally using 70 grains of No. 1204 powder and a special 250-grain bullet in the .30-'06 case. All the load did was perceptibly swell the chamber, which was later reamed out to .300 Magnum caliber.

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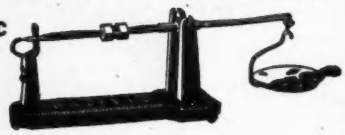

Complete with weights, **$8.50.**

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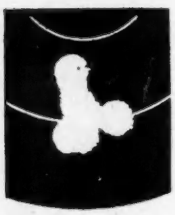

Actual size group 5 shots, 100 yards .257 Magnum. 100 grain SPEER Bullet, 60 Gr. No. 4350. Fired by B. R. Ennis, Council, Idaho.

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NAME_____

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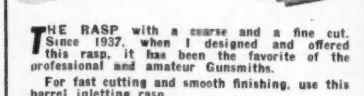
CITY_____STATE_____

BARREL INLETTING RASP



THE RASP with a coarse and a fine cut. Since 1937, when I designed and offered this rasp, it has been the favorite of the professional and amateur Gunsmiths.

For fast cutting and smooth finishing, use this barrel inletting rasp.

Sizes: ½" and ¾" diam. 2" long.
Price: as illustrated_____each $2.25
Set of 2 rasps and one handle _____ $4.25

FRANK MITTERMEIER ● Gunsmith Supplies
3577 E. Tremont Ave., Bronx 61, N. Y.

NEW EZE-SCORER: IN .22 - .38 - .45

(OFFICIAL N.R.A. GAUGES)

At last a new and patented scorer for both wad cutter and ball cartridges. Nothing else like it. Really shows whether the shot breaks or not. Stops protests. Speeds accurate scoring. 1¼" built in magnifier saves eye strain. All flanges tested to ten-thousandths. You'll want one eventually! Why not today? Retail $2.00 each at your GUN STORE or write

RIG PRODUCTS CO. ● Oregon 3, Ill.

Gun Insurance

for NRA Members and Clubs
WRITE FOR PARTICULARS
CARPENTER INSURANCE SERVICE
1206 19th St., N.W. Washington 6, D. C.

Christy Gun Works, 874 57th Street, Sacramento 16, California, have among other interesting gunsmithing items some very attractive band ramp front sights and also Caterpillar ramps to be sweated on the barrel. The band ramps come in four sizes: .757, .600, .620 and .640 inch. They come in three heights: ¼, ⅜ and ½ inch. The Caterpillar ramps come in ⅜- and ½-inch heights only. The band ramps list at $6 each and the Caterpillar ramps at $4.

☆ ☆ ☆

Kimball Arms Co., well-known dealers in antique and modern arms, 221 Cambridge Rd., Woburn, Mass., is publishing its seventeenth catalog of antique American and foreign arms.

☆ ☆ ☆

Dayton-Traister Co., 34 S. E. 66th Ave., Portland 16, Oregon, have made some changes in their special triggers and also in the method of installation. These triggers, when installed in Enfield, Mauser and Springfield actions, shorten the firing pin travel and thus provide a speed lock action. They require the use of a heavy duty mainspring, which is included with the trigger.

These triggers have been in use quite regularly for some time now, and all of them we have tried are quite satisfactory. The retail price for the Mauser trigger is $15.00.

☆ ☆ ☆

C. R. Pedersen & Son, Ludington, Mich., are featuring a small, practical engine turning tool or an abrasive holder to be used in a hand drill or, preferably, a drill press. Essentially, it is a small, brass tube used as a holder only for cylindrical stick-form impregnated rubber abrasives. Being threaded on the inside, a screw is turned down to expose a new supply of the abrasive material for engine turning bolts and other accessories. We have found the engine turning tool quite practical, but the abrasive wears down rapidly, especially near sharp corners or edges.

☆ ☆ ☆

Philip V. Hershey, Ashland, Ohio, has satisfied many customers with the power, accuracy and price of his 8-mm. custom loads. We tried some of them in a light 8-mm. sporter, and obtained excellent results. With 46.0 grains of No. 3031 powder and a 170-grain bullet, the load should have a velocity of about 2650 foot-seconds.

☆ ☆ ☆

Terhaar Gun Works, 3108 Main St., Jacksonville, Fla., have made a few changes in their ventilated sight ramps. The barrel band and hood have been streamlined and the ramp made longer. The ramp is lighter than one made of solid steel would be, and it is quite attractive on a lightweight sporter.

☆ ☆ ☆

Southwest Cutlery & Mfg. Co., Inc., 13 Olympic Blvd., Montebello, Calif., says the increased cost of manufacture of their very good plastic Pointer Stocks requires a price advance. The walnut and ebony colored stocks now list at $6.50, the ivory colored at $7.00. There is no price increase for the Pointer Pups, full-size imitation stag horn grips without a thumb rest. Other items available at reasonable prices from Southwest Cutlery are molded butt extension spacers, rifle stock inlays, grip cap spacers and thick recoil pads.

THE ARMS CHEST

GENERAL REQUIREMENTS APPLICABLE TO CLASSIFIED ADVERTISING

1. Rate: 25 cents per word including name and address—minimum charge $3.00. Advertisements *must be accompanied by remittance*, made payable to "National Rifle Association"—1600 Rhode Island Ave., Washington 6, D. C. *Insertion will not be made until payment is received.*

2. Closing Date: All advertisements must be received with advance payment by not later than the 1st of the month preceding date of issue. (Example: July 1st for the August issue. Ads received after July 1st and not later than August 1st will be inserted in the September issue.)

3. Who May Advertise: Any individual or firm whose advertisements and methods of doing business meet our requirements may advertise their goods or services in the ARMS CHEST.

4. All Orders Subject to These Conditions: We reserve the right to edit all copy to conform with our standards and to reject or discontinue any advertisement which we consider undesirable.

5. Transactions Based on Good Faith: ARMS CHEST transactions are based on good faith and mutual satisfaction. Deliberate misrepresentation, disregard of usual business ethics, or the attempt to circumvent these general requirements, will result in refusal of further advertising and might result in disbarment from the NRA, in the case of members.

6. Blind Ads Not Acceptable: Blind ads, with box numbers *only*, will not be accepted. Give your COMPLETE name and address, to insure prompt delivery of all mail or telegraph replies.

7. How to Count Numerals, Etc.: Groups of figures are counted as one word (example: .30-30, 250-3000, $150.00, $1.50). Abbreviations consisting of initials or single characters are counted as one word (example: W. H. Smith; H. B., meaning heavy barrel). Hyphenated words are counted as two words (example: 20-gauge, pearl-handled, no-slip).

8. Responsibility for Illegible Copy: Type or print ads plainly, for we can not be responsible for errors due to illegible writing.

9. Firearms for Sale or Trade Should Be Properly Described: We urgently recommend that the *condition* of every gun (including essential parts) advertised for sale or trade, be clearly indicated in accordance with the following *NRA standard descriptions*: PERFECT—meaning factory condition; EXCELLENT—meaning new condition, implying negligible amount of use; VERY GOOD—meaning practically new condition; implying little use, with no appreciable bore wear and only minor surface scratches or wear; GOOD—meaning moderate use with some finish worn off, only moderate bore wear, with no pits and nothing worse than a little roughness in the bore; FAIR—meaning no parts missing necessary to use of gun, reasonable wear inside and out, nothing worse than minor pits in steel or stock, gun sufficiently accurate for hunting. POOR—meaning marred appearance and pitted or badly worn bore.

We further recommend that when price lists or catalogs are offered, the *condition* of every weapon or item so listed be properly described in accordance with these NRA standards.

WARNING TO PURCHASERS: The National Rifle Association *will accept no responsibility whatever* for *any* unsatisfactory transactions involving guns or other items which have not been described in accordance with the foregoing NRA standards. It is therefore important for purchasers to *insist* that sellers give full and complete descriptions of all items in accordance with these standards—*before* any such transactions are consummated.

10. Privilege of Examination: Requesting shipment by express C. O. D., *with examination privileges* will permit the purchaser to inspect the merchandise *in local express office* and authorizes the express company to return unsatisfactory merchandise at shipper's expense.

11. The National Firearms Act forbids the sale of the following: (*a.*) Full automatic machine guns. (*b.*) Rifles and shotguns with barrels less than 18 inches in length or 16 inches in the case of a weapon of .22 or smaller caliber. (*c.*) Handguns such as the Mauser or Luger automatic pistols, when such weapons are equipped with detachable butt stocks, except that all of the above may be sold by a Federal licensed dealer who has paid the special tax required by Section 3260, Internal Revenue Code. NOTE:—"Barrel length", as it applies to the above, is determined by the insertion of a cleaning rod from the muzzle until it comes to rest against the face of the closed breech.

In addition, the NRA has adopted a policy of not accepting advertisements covering small *pocket* pistols or revolvers of less than .38 caliber, or with barrel lengths of 2 inches or less, which have no practical value as target, police or military weapons.

12. Fair Trade Laws: All states with the exception of Missouri, Texas, Vermont and the District of Columbia have Fair Trade laws which permit manufacturers to contract with their distributors to maintain standard retail prices. Dealers who fail to do so are subject to legal action.

FOR SALE

ANTIQUE GUNS—THIS MONTH I AM offering a first issue, first model S & W *22* with flat spring catch (see June 48 RIFLEMAN); a first model S & W with round side plate and conventional catch; a converted 31 cal. Percussion Remington New Model, full engraved, with gold plated cylinder, rammer and hammer, entire frame silver plated, pearl grips, mint condition; a pair of silver mounted mask butt, flintlock pistols of English manufacture with rifled barrels by J. A. Kuchenreuter. These pistols cut for shoulder stock and are extremely rare and beautiful. 1902 Colt auto. 38 6" VG to excellent in and out $55.00; 1903 spur hammer 38 Colt auto 4", about new $55.00; Colt new 41 C.F., loading gate, British Proofs, nickel, very fine $55.00; Philadelphia Derringer 7" overall, very fine $65.00; Colt #2 Derringer, fine $49.50. Herb Glass, Bullville, N. Y. (20 miles West of Newburgh) Phone Middletown 96-3021.

BERT-TONY CROW-TONED CALLS COME in pairs, with full instructions, $5.00 Manufactured by author of "Crow Shooting," Bert Popowski, Aberdeen, South Dakota.

FACTORY REJECTS—AMAZING VALUE! Same genuine Imported Briar as our regular $10.00 pipes. Have surface flaws not affecting superb smoking qualities. Outstanding buy. 2 for only $1.00. Satisfaction Guaranteed. Gaylords, Dept. 285, Brockton 64, Mass.

S&W K-38, KING RIB, SHORT ACTION, Cockeye Hammer, Perfect, $75.00; K-38, same as above, with: Wisler 4 gun Kit-38, Mossberg Spotshot, O'dell Mount, Mossberg Stand, Pacific Standard Tool, .38 Spl, .45 ACP Dies, Autopriming device, all for $165.00; S&W 6½ Magnum, Excellent, $100.00; S&W Triplelock, .455 Factory Converted to .45 Colt, Excellent, $100.00; Winchester 52 Standard, Lyman 48 Extension, Scope Blocks, 17A and Dockendorff Front, Sheepskin Case, Excellent, $85.00; Enfield Custom Mannlicher Sporter, Ramp Front, Redfield Olympic (old Style) Rear, Sling, Checkered PG Forend Butt, Beautiful Cheekpiece Stock, Excellent, $100.00; Winchester Model 1876 Military, .45-60, Very Good, $25.00; German SS, Martini Type, 8.15X 46R, Very Good, $25.00. H. L. Remmel, 108 West Ninth, Little Rock, Arkansas.

GUNS, REVOLVERS, AMMUNITION, ALL sizes. Mail 10¢ in coin for list. Miller's Sport Shop, Dept. R-142 N. 8th St., Phila. 7, Pa.

NEW LIST OF MUZZLE LOADING RIFLES. Also cap and ball revolvers for shooting. 3¢ stamp please. Kimball Arms Company, Woburn, Mass.

CLOSING OUT. MY PERSONAL VARMINT Rifles. List for stamp. Ratliff, Hillyard, Washington.

CARTRIDGE COLLECTORS' CATALOG—Entirely New Issue—#2, with illustrations and interesting data, invaluable for collectors, shooters and dealers. Most complete publication of its type. Sent postpaid for 35¢. Life Member. Philip Jay Medicus, Dept. A7, 18 Fletcher Street, New York 7, New York.

MANNLICHER-SCHOENAUER WITH NEW Roberts 257 barrel and Zeiss quick detachable scope and case. Sheepskin rifle case. Rifle excellent in and out. Price $250.00. Will trade for S&W 357 magnum or Film pack camera. Glenn Curry, Fortuna, Humboldt County, California.

PERCUSSION COLT AND REMINGTON parts. Flint and percussion locks. List 25¢. C. H. Weisz, 100 S. Uhle Street, Arlington, Virginia.

WAFFENWERKE-BROWN MAUSER, 7 MM, 23½" round barrel, commercial, set triggers, weight 7 lbs. with sling, very good to excellent, $170.00. Remington model 722, never fired, excellent $65.00. R. Sykes, R.F.D., Friday Harbor, Wash.

BE YOUR OWN WEATHER MAN! THIS perfect reproduction of original Clipper Ship Weather Glass responds immediately to warn you of approaching local and distant storms. Glass entirely hand-made. No two alike. Useful and attractive. $2.50 postpaid—or send for illustration. Satisfaction guaranteed. Levitt Prod., 884A Westminster Rd., Woodmere, L. I., N. Y.

NEW COLT, SMITH AND WESSON, HIGH-Standard Pistols, ten percent under list prices. Perfect .38 Officer's model target $65.00. Excellent postwar K-22 $50.00. All large calibre rifle cartridges ten percent under list. Twelve gauge #8 and #9 Remington and Western shells $30.00 case five hundred. Western Super X long rifle $90.00. Case ten thousand. Many other splendid buys! Satisfaction guaranteed by shooter member. Merchandise F.O.B., Ocala Pawnshop, Ocala, Florida.

GENUINE PATERSON—COLT, FINEST ENgraved, silver inlaid, deluxe specimen extant. Jim White, 2207 Lincolnwood, Highland Park, Illinois.

THROWING KNIVES, PERFECTLY BALanced, handcrafted, with sheath, instructions, $1.50 postpaid. Stark Manufacturing Company, 1718-R, Walnut, Allentown, Pennsylvania.

AMMUNITION ADVICE FROM A SPECIAList. The fall season is drawing near. Don't wait until the last minute to place your orders. At the present time, we have, for immediate delivery, a complete and fresh stock of over 325 types of Factory Loaded cartridges for practically all kinds of American and foreign rifles, pistols and shotguns. This is the largest variety offered by any firm in America and the prices are the lowest authorized by the manufacturers. Prompt service, orders shipped on day of receipt. Send 3¢ stamp for new 8-page list. Life Member, Philip Jay Medicus, Dept. A7, 18 Fletcher Street, New York 7, New York.

BIG CATALOG, ANTIQUE GUNS. $1.00. 475 photographs. Satisfaction guaranteed. G. B. Hebard, Knoxville, Illinois.

GUN RACKS, SOLID WALNUT, NEW, TO hold 4 guns, handsomely made, $6.95. For 6 guns, $9.95. 4th Annual Gun Digest $1.50. Send money order. Public Sport Shops, 11 S. 16th Street, Philadelphia 2, Pa.

SERVICEABLE SA COLT PARTS—MAINspring $2.00; hammer $3.25; trigger $1.25; gate $1.75; ejector head $1.50; trigger guard $3.25; screws 35¢ each; .45x5½" barrels, pitted, $2.50. 20-shot magazine for .30/06 Springfield $6.75. C&B revolver repair parts. B. K. Wingate, Box 481, Reading, Pa.

Are YOU Ready for the Hunting Season?

Do your guns need repairing—or rebluing?

Planning on new sights, a top-quality scope, better scope mounts, a Polychoke or Cutts Comp?

Right now your favorite gunsmith is in a *much* better position to give you prompt service on your special needs, than he will be later on in the hunting season!

☆ ☆ ☆

P.S. If you have any extra deer rifles, duck guns or other excess hunting supplies, an ad in the September 'Arms Chest' will move them for you quickly—and profitably.

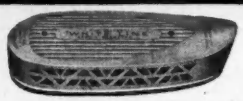
☆ ☆ ☆

Your ad "copy" for the September issue must reach us, with remittance, not later than August 1st.

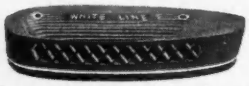
Look For The Name

"WHITE LINE"

None Equal Regardless of Price



DeLuxe "White Line" Recoil Absorber—A brand new principle of recoil absorption in the world's finest recoil absorber. Large and small sizes. Red, brown and black colors. Skeet, Speed and Regular styles . . **Only $3.50 Ea.**

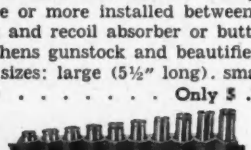


The Original "White Line" Recoil Absorber—For shotguns and rifles. Used and recommended by expert shooters everywhere. Skeet, Speed or Regular styles in jet black, walnut brown or tile red colors. . . . . **Only $3.25 Ea.**

"White Line" No-Slip Butt Plate

Transverse sawtooth gripping surface holds rifle to shoulder regardless of shooting position. Three sizes—a size for every rifle. Indispensable for all target shooters Jet black, walnut brown, or tile red colors. Utmost quality at **Only $2.00 Ea.**

"White Line" Butt Extension Spacer—One or more installed between gunstock and recoil absorber or butt plate lengthens gunstock and beautifies gun. Two sizes: large (5½" long). small (5" long) . . . . . **Only $ .75 Ea.**



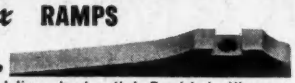
"Sure Grip" Shell Pack—Made of pliable, durable rubber Fits any ordinary belt up to 2" wide. Holds any 10 shells from 25 to 35 caliber, securely, but instantly available Prevents loss of ammunition. Jet black, walnut brown, or tile red colors . . . . **Only $1.95 Ea.**

These are only a few of scores of Mershon necessities for hunters, target shooters and outdoorsmen All are absolutely guaranteed to give complete satisfaction or money back. *Ask for and look for the "White Line"* It is your assurance of utmost in quality, value and satisfactory service. See your dealer or gunsmith. *Canadian representatives—Scope Sales Company, Ottawa, Ontario*

MERSHON COMPANY, Inc.
Exclusive Manufacturers of
"WHITE LINE" PRODUCTS Since 1935
511 East Broadway • Glendale 5, Calif.

Rex RAMPS

$2.



Graceful lines—hand matted. Furnished with screw. ¼-5/16-⅜-7/16-½-9/16 heights, white or blue. Marble #37 Gold, Ivory $1.25. Sheard Gold...$1.75
Dockendorff crosswire or bead 5.75
Redfield #70 receiver sights 9.50
Redfield #102 receiver sights 6.50

Rex HARD ACTIONS DRILLS

To drill action without annealing. #31-28, ea. $1.00

Rex ENGINE TURNING TOOLS

Screw fed abrasive tool that simplifies engine turning. With 3 tips and instructions..... 2.50
Tips 3 for $.25—Dozen ..... .60

ENFIELD SPEED ACTION KIT

New; Simplified: just install parts for short fall, fast cocking, slick trigger. Send sear, cocking piece, trigger with order, and..... 5.00

ENFIELD DELUXE $23.50

We cut & crown barrel, mount ramp sight. Precision grind receiver, straighten trigger guard. Polish and blue to high lustre.

MAUSER DELUXE $38.50

New REX 6 groove barrel installed, ramp mounted, deluxe blued. Cal. 257, 250 Sav. 270, 300 sav. 30-06. Write for list. Satisfaction guaranteed.

C. R. PEDERSEN & SON Ludington Michigan

BULLETS

Dia.	Type	Make	Gr.	Wt.	Per "C"
.223"	S.Pt.Hornet	Sierra	40 & 45		$2.25
.224"	S.Pt.Hornet	Sierra	40 & 45		2.25
.224"	S.Pt.Spitzer H.V.	Sierra	45, 50 & 55		2.75
*.224"	S.Pt.Rd.Nose H.V.	Sierra	45, 50 & 55		2.75
.224"	S.Pt.6-Ogive Med.V.	Moffat	45, 50 & 55		2.50
.228"	S.Pt.Semi-Spitzer	M & G	70		4.00
.243"	S.Pt.8-S	Morse	75 & 85		4.25
.257"	S.Pt.Semi-Spitzer	M & G	60 & 87	$4.00 &	4.20
.257"	S.Pt.Semi-Spitzer	M & G	100 & 117	$4.40 &	4.60
.257"	S.Pt.Semi-Spitzer	M & G	125		4.80
.257"	H.Pt.Spitzer	Collins	87		4.20
.257"	S.Pt.Spitzer	Collins	100 & 117		4.20
.257"	S.Pt.Spitzer	Sierra	100		3.85
.263"	S.Pt.Spitzer	Ebel	120		4.50
.263"	S.Pt.Semi-Spitzer	M & G	100		4.50
.263"	S.Pt.Semi-Spitzer	M & G	129 & 150		5.00
.263"	S.Pt.Rd.Nose	M & G	139		5.00
.308"	S.Pt.Semi-Spitzer	M & G	110 & 125	$4.40 &	4.80
.308"	S.Pt.Spitzer	Sierra	150 & 180	$4.50 &	4.75
.308"	Semi-Spitzer	Auert	150		4.50
.308"	S.Pt.Spitzer	Auert	180		4.75

* Match Grade in 50 & 55 Gr. weights.
Also M & G in .270, 7 M/M, .30 & 8 M/M Cal. Speer bullets in stock in most caliber & weights. Write for bullet price list or order now.

CUSTOM GUNSMITH SERVICE
10329 Stagg Street Sun Valley 3, Calif.
(Sun Valley was formerly the city of Roscoe)

HUNTERS SPORTSAW

BUTCHER YOUR GAME FAST & CLEAN IN FIELD OR CAMP. SPORTSAW folds and locks to carry safely on belt. Wt-8 oz. L-11 in. Swedish steel blade, birch handle. A "MUST" for big game hunters, freezer owners & home. IDEAL GIFT. At your dealer or direct $3.95

I. C. Thomas & W. E. Edwards Pat. Pend.
(Now in use throughout U.S., Canada & Alaska)
2002 N. GLENOAKS BURBANK, CALIF.

SPECIALIZING in Improved and Wildcat Calibers

A few listed below:

.219 Wisp	.220 Swift Imp.	.228 Magnum
.22/250	.257 Imp.	8 MM '06 Imp.
.25/06 Imp.	.270 Imp.	.35 Whalen Imp.

Chambering or rebarreling to your action or to new F.N. Action. Dies and bullets. One week delivery on "Miser Magnums." Chambering.
Write for Illustrated price list.

HOFFMAN Custom Gun Shop • Evanston Wyoming

SHARPEN YOUR HUNTIN' EYE!

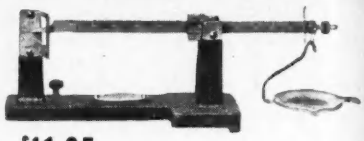
Shoot your 'game' at 50 feet or less! Silhouettes printed in lifelike gray-brown on heavy tagboard. Precision scaled to actual hunting distances.
SCIENTIFIC TRAINING - FASCINATING SPORT!
Forget make-shifts! Use the real thing! Have more practice and more fun with

GAMETARG

Exciting NEW gallery game targets!
Deer • Coyote Woodchuck Squirrel • Crow
25 for $1.00; 100 for $2.50 (all one kind)
Postpaid U.S. Cash or M.O. Sampler (4 each of 5 different Gametargs) — $1.00
Order direct from
E. Wayne Williams, 50 East 42nd Street, New York 17, N. Y.

REDDING

POWDER & BULLET SCALE
FAST-ACCURATE-DEPENDABLE



$11.95 Postpaid

Tenth grain accuracy with tenth grain over and under graduations—clearly graduated beam with self-aligning bearings—brown wrinkle finish base with leveling screw—325 grain capacity—no weights required. "You get it—just set it!" Folder on request.

Order thru your dealer or from—

THE REDDING CO.
BOX 524 CORTLAND NEW YORK

.22 REM. PUMP, FORE ARM POOR, NEW barrel and stock. $25.00. Single Action 44-40 H.A. good, $18.00. 12 ga. 97 Win. Pump, 30" full, good, $42.50. .30-40 Krag, 24" barrel, good, $37.50. Arisaka conv. .300 Sav. cal. very good, $35.00. Others, card for list. Orahood Gun Shop, Ordway, Colo.

GOOD NEWS! PAUL RATLIFF, SPOKANE 14, Washington, is breaking up his famous collection of Single-shot and Big Game rifles. Wire, phone Glenwood 4172, or air mail. List for stamp.

INFRA RED SNOOPERSCOPE TUBE. PERmits nightime vision. Tube and complete instructions $14.95. Very limited quantity. Precise Measurements, 942 Kings Highway, Brooklyn 23, N. Y.

LARGE COLLECTION OF AMERICAN AND European antique arms. Send 25*e* in coin for our 17th catalog featuring the private collection of a gentleman of Massachusetts. We buy whole collections or single pieces. Fair prices paid. Kimball Arms Company, Woburn, Mass.

ELECTRIC PENCIL: ENGRAVES ALL Metals $1.25 postpaid. Beyer Mfg., 10511-Z Springfield, Chicago 43.

WIN., MARLIN. CARBINES, $59.00. 150 Trap, Skeet, Hunters guns, list, dime. Phone 4012 Z, Hershey's, Orville, Ohio.

ILLUSTRATED 179 PAGE CATALOG OF ANtique firearms and edged weapons 50*e*. Robert Abels, R-860 Lexington Avenue, New York 21.

FREE SERIES OF BULLETINS ON MODern guns through 1949—write to Allan Luithle, Highway #10, General Delivery, Morris Plains, N. J.

IMMEDIATE DELIVERY, NEW GUNS, Rifles, handarms, scopes, binoculars, ammunition. Send stamp for list. Discount to dealers. Many good buys. Overly's Gun Rack, Ephrata, Penna.

NEW BOUND CATALOG CONTAINING hundreds of antique and modern arms, edged weapons, cartridges, accessories, small antiques. 25*e*. H. A. Brand, 105 E. Third St., Cincinnati 2, O.

"SHOTGUNS"—"RIFLES" "HANDARMS"—"Ammunition"—"Rods"—"Reels". List 10*e*. A. R. Rudolph's, Atchison, Kansas.

INVENTORS: HUNDREDS OF MANUFACturers have requested our assistance in locating marketable new products. Complete information free. Institute of American Inventors, Dept. 131, 1926 Eye St., N. W., Washington 6, D. C.

TENTS, WAR SURPLUS, ALL SIZES; COTS, hammocks, camping equipment, canvas covers, fishing & sporting goods, rope. Morsan, 10-191 50th Avenue, Long Island City 1, N. Y.

CARL ZEISS 20X50 BINOCULAR, LIKE new, $250.00. Write for details. G. F. Cernik, 3816 East 154 Street, Cleveland, Ohio.

AMMUNITION WANTED—FACTORY loads only, in good condition. We can use almost any size or make. Will pay cash or trade. Let us know what you have, stating price or trade desired. Life Member. Philip Jay Medicus, Dept. A7, 18 Fletcher Street, New York 7, New York.

CLOSING OUT—BULLETS, ONCE-FIRED cases. List for stamp. Ratliff, Hillyard, Washington.

SPRINGFIELD 45/70 PARTS
NEW BARRELS $8.50—LOCKS, RECEIVERS, SIGHTS, BULLET MOULDS, etc. *Send for FREE list*
JAMES E. SERVEN · Santa Ana, Calif.

ARE YOU TRIGGER HAPPY?
IF NOT, SEE YOUR GUNSMITH NOW!

The Mark II Trigger will give you a sweet bolt action on your Enfield *plus* a smooth, crisp trigger. Also fine speed-lock triggers for your Springfield or Mauser for $15, or single stage triggers for all three at $12.50 each. If your dealer doesn't have them, send us his name and address. Liberal discounts to gunsmiths and dealers.

DAYTON-TRAISTER CO.
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EXCELLENT MODEL 70-270 RECOIL PAD, Lyman 48, 250 rounds, 130 gr. ammo. $125.00. Very good .22 cal. target Springfield Armory $40.00. Excellent 45 cal. Colt Auto. $35.00. J. Allen, Box 385, Pawtucket, R. I.

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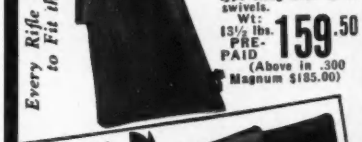

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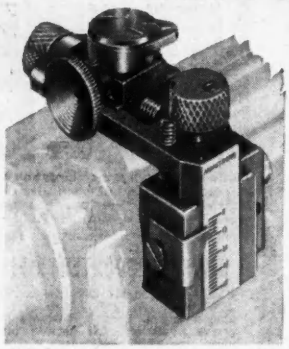

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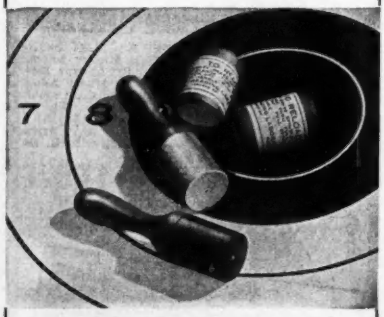

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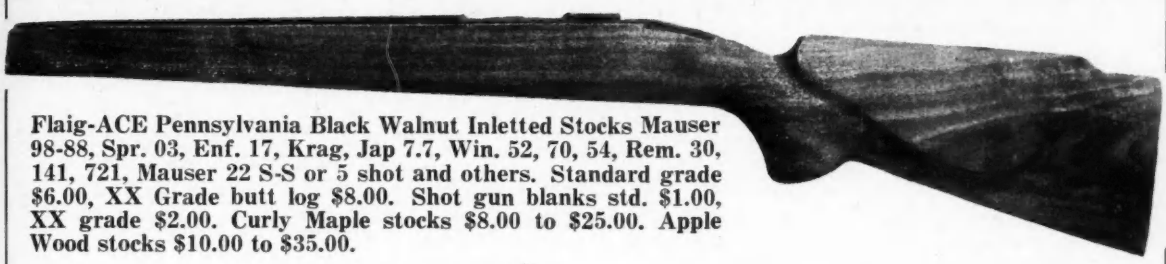

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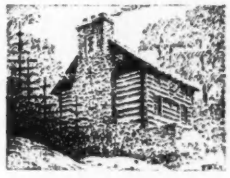

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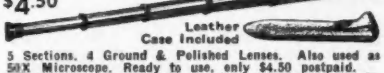

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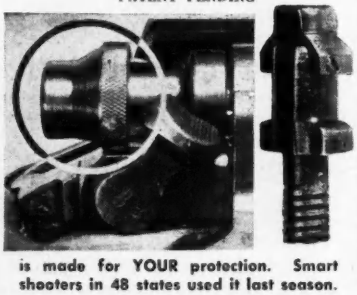

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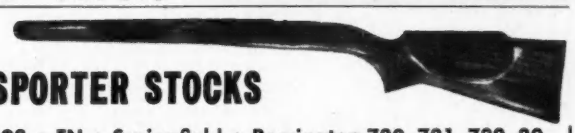

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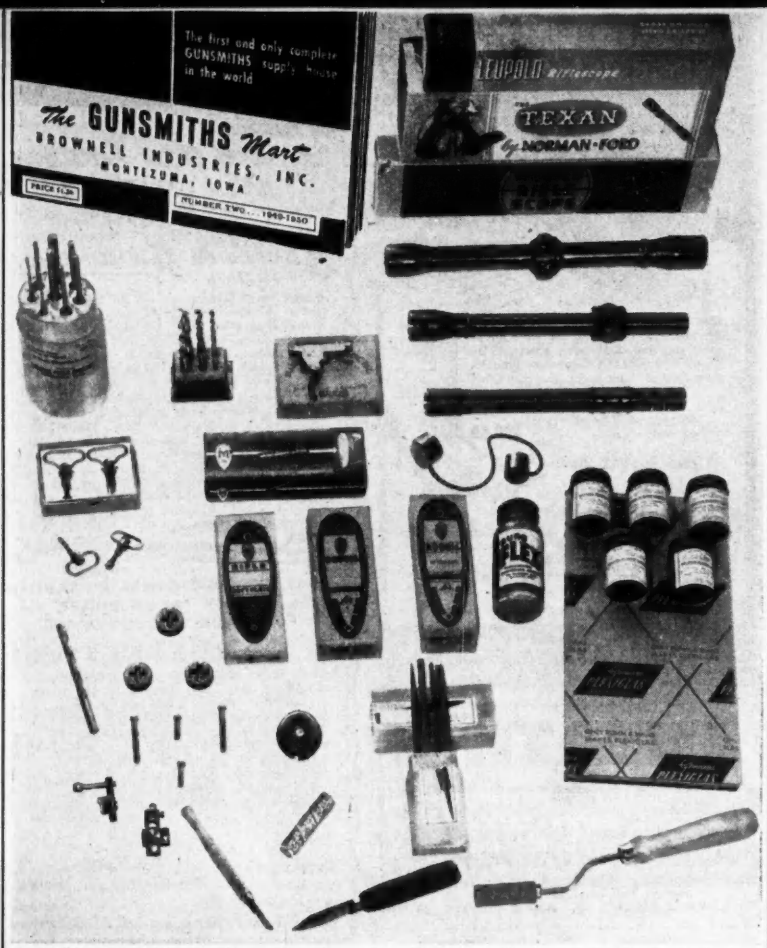

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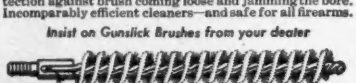

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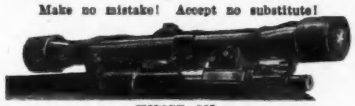

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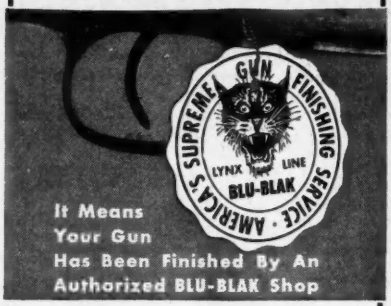

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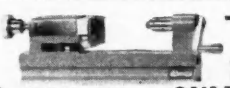

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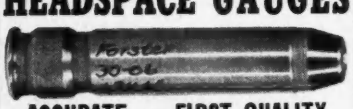

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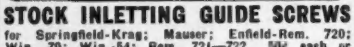

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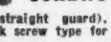
GUARD  **SCREWS**

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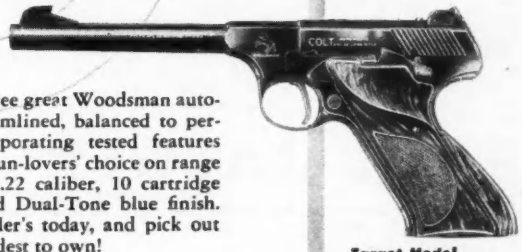

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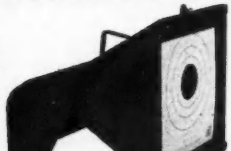

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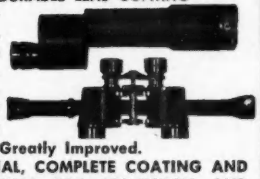

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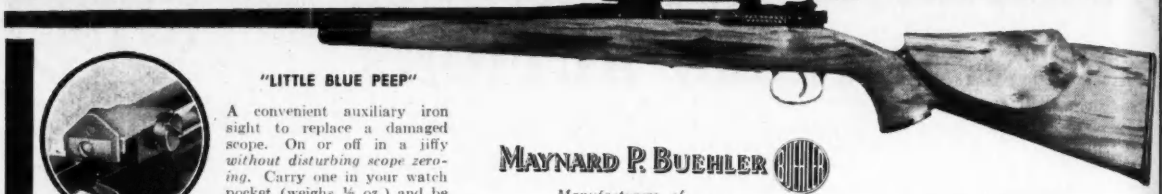

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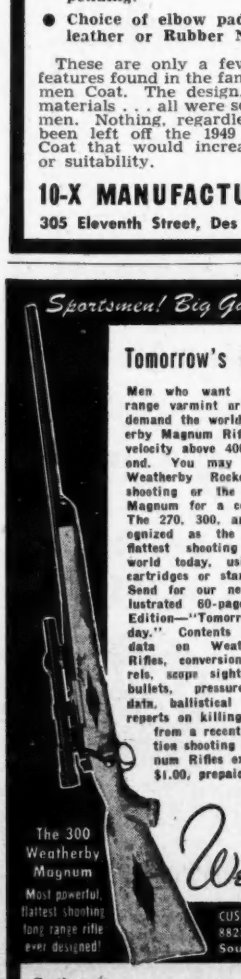

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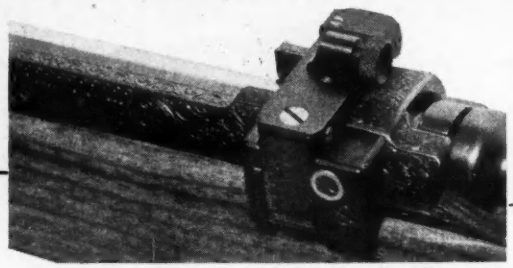

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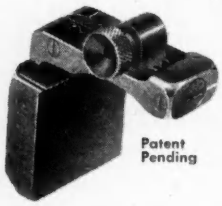

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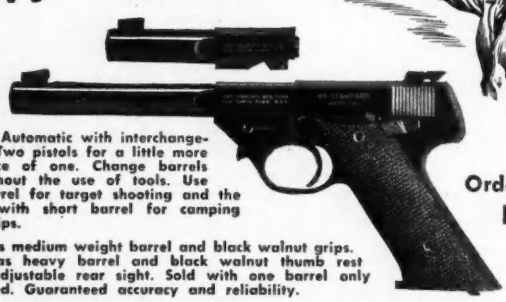

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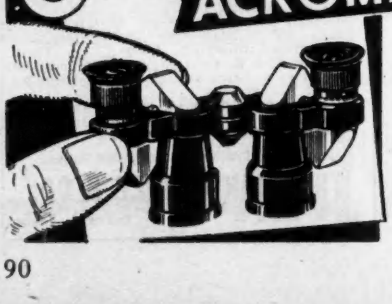

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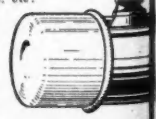

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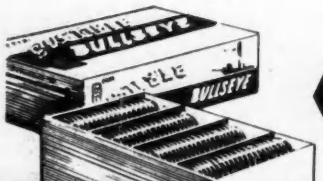

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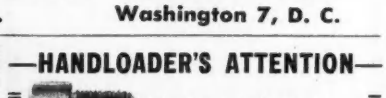

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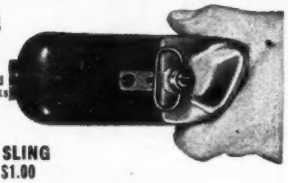

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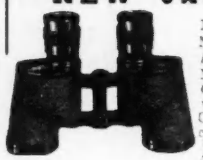

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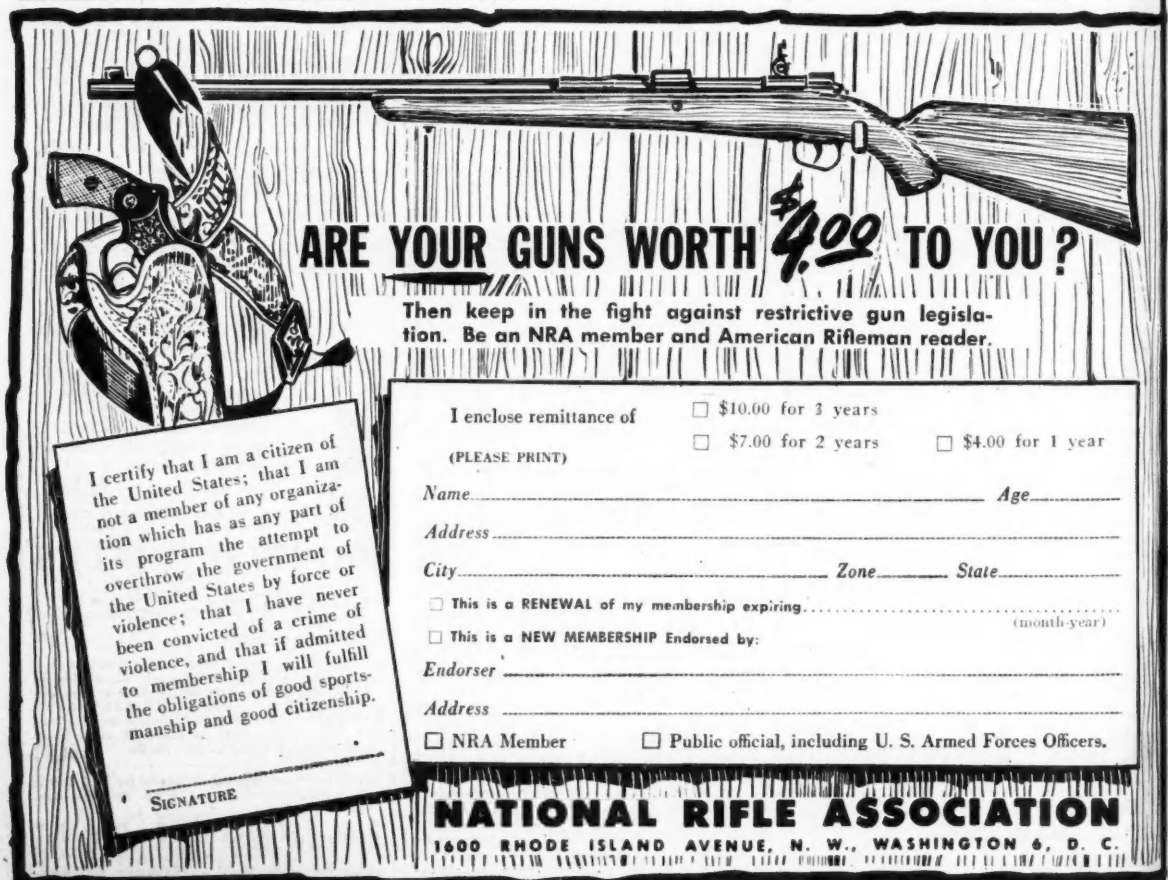
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